

# NetworkWorld

The leader in network knowledge ■ www.nwfusion.com

March 8, 2004 ■ Volume 21, Number 10

## Inside the DoD's crime lab

Digging for digital dirt.

■ BY DEBORAH RADCLIFF

Digital evidence comes in all shapes and sizes: pallets full of computers, a hard drive with an AK-47 bullet hole in it, audio tapes fished out of the ocean, mangled floppies, garbled 911 calls.

Whenever U.S. government agencies investigating a crime or a cybercrime have digital evidence that's too difficult to analyze, they send it to the Department of Defense computer forensics lab.

The evidence can arrive in a military vehicle, via FedEx or through the U.S. Postal Service. However it gets there, it's accepted at the loading dock of an unmarked commercial building on the outskirts of Baltimore.

It's then logged and sent to an evidence custodian, who inventories, tags and stores it in a locked cage.

Network World was invited to the Defense Computer Forensics Lab (DCFL) for an inside look at how computer investigators at the cutting edge are using digital evidence to help solve crimes.

See Computer crime lab, page 37.

Air Force Lt. Col. Ken Zatyko says the lab's case-load increased from 148 in 2000 to 425 in 2003.

RANDALL SCOTT

## Microsoft users decry no bang for big bucks

■ BY JOHN FONTANA

A host of Microsoft users say they have received nothing in return for the tens of thousands of dollars spent on software maintenance contracts set to expire this summer.

The issue, which is coming to light as Microsoft delays various product shipment dates, could explode and might cost Microsoft billions of dollars, observers say. Hundreds of thousands of customers are thinking twice about renewing software maintenance contracts that will expire by July.

With the renewals so critical to Microsoft's balance sheet and its battle with open source alternatives, end users might have the best negotiating opportunity they will ever see, the experts say.

Scott Matthews, CTO for Digi-tech Systems in Greenwood Village, Colo., says he hopes that

is true.

In June 2002 he spent \$30,000 on a software maintenance contract for SQL Server under Microsoft's new annuity licensing program called Software Assurance. The program was introduced two years ago to reduce Microsoft's

See Microsoft, page 53



### Charged

Former WorldCom CEO Bernie Ebbers faces federal fraud charges. Customers react, page 10.

AP PHOTO/MASAHITO YAMAMOTO

## Bottom line alone isn't selling VoIP

Productivity claims draw mixed reactions.

■ BY PHIL HOCHMUTH AND TIM GREENE

ORLANDO — VoiceCon 2004 demonstrated that more businesses are seriously considering VoIP, but the benefits of the technology remain difficult to justify using just traditional bottom-line analysis.

The event bucked the shrinking-show phenomenon that has plagued the IT industry by drawing 3,500 attendees and 107 exhibitors to the Walt Disney World Dolphin Hotel, up from last year's 3,000 attendees and 53 exhibitors.

A mix of IT professionals from the telecom and datacom worlds heard the latest about VoIP product and service developments. But customers say they still find it difficult to make the case that the technology will save money, so high-profile vendors stepped in urging an alternative rationale: increased productivity.

In a keynote address, Avaya CEO Don Peterson said the real value of converged networks is letting

See Voice, page 52

A Wider Net

## More than just a modem man

■ BY TIM GREENE

Maybe Brent Townshend would have wound up in court no matter what he invented.

Since creating 56K bit/sec modem technology in the mid-1990s, the California engineer has spent a lot of time suing companies that don't license it upfront and has amassed a fortune in the process. Although he had been out of the spotlight in recent years, Townshend reached an out-of-court settlement in December with Analog Devices over alleged misuse of his technology and has a court

See Modem, page 13



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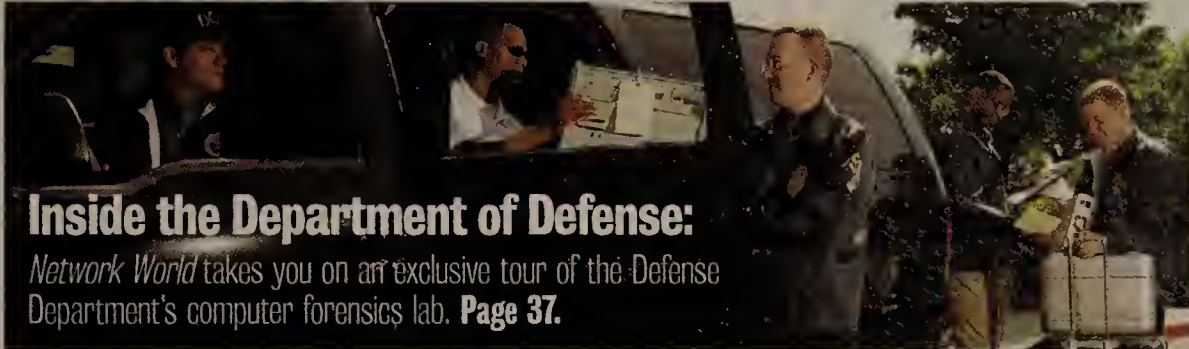
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ILLUSTRATION BRIAN STAUFFER

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Network World takes you on an exclusive tour of the Defense Department's computer forensics lab. **Page 37.**

CLEAR CHOICE



TEST

### Dell's PowerConnect 6024

Dell hits price/performance mark with new Gigabit Ethernet switch. **Page 40.**

## NetworkWorldFusion

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## Exclusive

### Dell Gigabit Ethernet switch review exclusives

Head online to get the detailed background on how our testers conducted this week's review of Dell's PowerConnect 6024.

**DocFinder: 1034**

### Audio primer: Basic wireless LAN security

In this primer, we look at some of the technologies and techniques used for securing a small office/home office wireless LAN network.

**DocFinder: 9946**

### Layer 8: Caption contest

See who won last week's caption contest and enter this week's at Fusion's not-just-networking Web log. Take a chance at glory — and a free prize.

**DocFinder: 9652**

## Seminars and events

### Messaging: From chaos to control

Messaging is in crisis. Ever-escalating e-mail assaults now threaten core competencies of even the most sophisticated corporations. It's time for better, more aggressive answers that again make messaging a corporate-safe application. Industry expert and Network World columnist Mark Gibbs will present the latest demos and new tools.

**DocFinder: 9876**

## Columnists

### Wireless Wizards

Subnetting a wireless LAN for voice. The Wizards answer Mike, who wants to know: "Is there a rule of thumb about the size of the subnet to design in order to have seamless roaming on a campus network wherever there is contiguous RF signal?"

**DocFinder: 1035**

### Telework Beat

Top-down telework, Part 2. The Caveo Group makes the Washington Council of Governments an offer it can't refuse.

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### SOHO Life

Growing with VoIP. Columnist Ron Miller examines how a VoIP system helped a roofing company expand and offer telework.

**DocFinder: 1037**

### Small Business Tech

A critical eye on recent offerings. Columnist James Gaskin separates what's hot from what's not.

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New

## Bits

## IBM, Sun mulling open source Java?

Representatives from IBM and Sun will meet soon to discuss IBM's proposal to create an open source version of Sun's Java technology, an IBM executive said last week. Sun wants to hear more details about IBM's proposal, such as which parts of Java IBM would like to see made open source and how such a plan might be carried out. "We've both asked each other to think about things to bring to the table, such as the scope of what we have in mind and how we might do this," said Bob Sutor, IBM's director of WebSphere infrastructure. Sun declined to comment on any meeting, and it remains unclear how seriously Sun is considering IBM's proposal. IBM applied public pressure to Sun recently when Rod Smith, vice president of emerging technologies with IBM's software group, penned an open letter to Sun encouraging it to offer an open source implementation of Java.

## Michael Dell gives up CEO title

Dell founder Michael Dell will relinquish his CEO title to current President and COO Kevin Rollins, the company announced last week. Dell will remain chairman of the company's board of directors. Rollins was appointed CEO during a meeting of Dell's board of directors Thursday in New York. The move will be effective as of the company's July 16 shareholder meeting. Dell still will be "deeply involved" in the day-to-day business of the company he founded as a college student in 1984, the Round Rock, Texas, company said. Rollins and Dell essentially have shared power at the company for several years in an unusual arrangement for a company of Dell's size.

## Site Finder foe sides with ICANN

Go Daddy Software, which last year filed a lawsuit against VeriSign regarding the Site Finder service, upped the ante in its opposition last week by pledging \$100,000 to help the Internet Corporation for Assigned Names and Numbers defend itself over its right to regulate VeriSign's registry services. Go Daddy's pledge comes in response to a suit VeriSign filed against ICANN that accused the nonprofit organization of overstepping its authority by trying to regulate Site Finder and other services the company introduced. Go Daddy defended ICANN's right to regulate the services and called for a formal review of VeriSign's position as an "exclusive registry." The Scottsdale, Ariz., company said it has sent letters to ICANN, the U.S. Department of Commerce and various U.S. senators calling for a formal review of VeriSign's registry position. VeriSign representatives were not immediately available to comment.

## COMPENDIUM

## Time for an e-mail IQ test?

**Brandon Fuller is on a 10,000-person mailing list at work. And last week, during the latest virus onslaught, he was amused to see just how many messages went out warning people about infected attachments — and follow-ups advising people to stop sending out warnings.**

*Read his full account at [www.nwfusion.com](http://www.nwfusion.com), DocFinder: 1045.*

## The Good The Bad The Ugly



**Showtime in Germany.** Who says trade shows are dead? Organizers of the annual CeBit expo in Hannover, Germany, say they expect about half a million people to attend the IT event, which runs March 18-24. That would be about on level with last year's show.



**Money to burn.** The 'Net was abuzz last week that the U.S. government has hidden radio frequency ID chips in \$20 bills to track your spending patterns. Need proof? Cooking the bills in a microwave oven makes them explode. But those in the know say that while there is metal in certain \$20 bills, there are no RFID chips in them. ▼



**Outsourcing is for 'chumps.'** Rep. Bernard Sanders (I.-Vt.) explains why he is introducing a bill to bar U.S. companies from getting federal funds unless they do a better job of protecting U.S. jobs: "[It] is an insult to the middle class of this country, that American taxpayer dollars are being used to provide loans, loan guarantees, grants, tax breaks and subsidies to huge and profitable corporations who then say to the American people: 'Thanks for the welfare, chumps. But we're closing your plant and taking your job to China.'"

## IDC: Disk storage sales up

Growth in revenue from sales of disk storage, particularly in the U.S., is stronger than it has been for two years. Worldwide factory revenue for external disk storage systems grew 8.4% year on year to \$3.7 billion in the fourth quarter of 2003, IDC said last week. The overall market for disk storage systems grew 6.1% year on year. Favorable exchange rates were a leading factor in growth outside the U.S., but the U.S. actually saw the strongest growth, at 7%.

## U.S. urges China to rethink WLAN plan

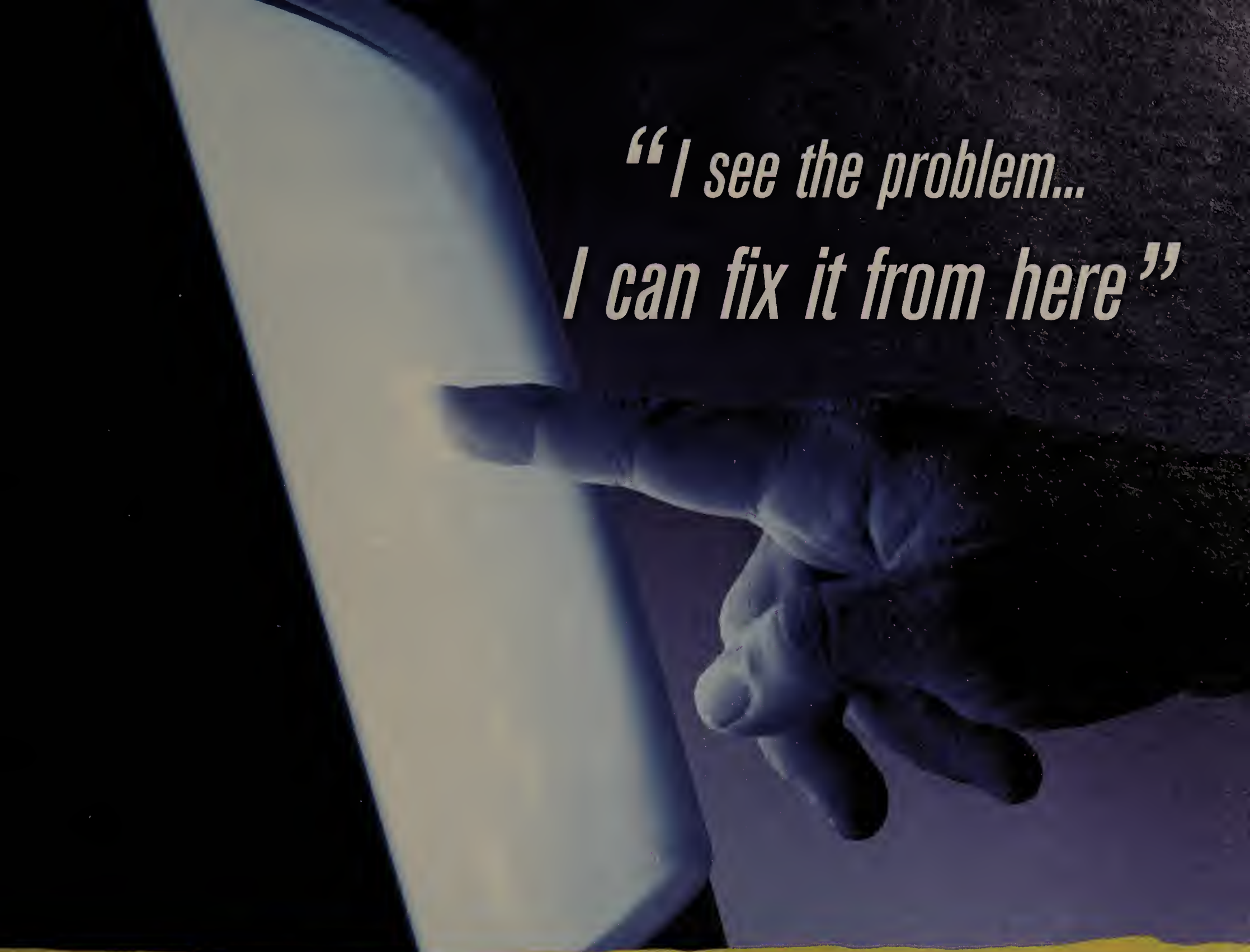
The Bush administration last week indicated it is taking steps to convince China to rethink its plan to impose a secret wireless encryption standard on all wireless LANs used in China as of June. As part of the plan, China also intends to require all equipment manufacturers, including foreign manufacturers, to license the Chinese encryption standard called WAPI from a list of about a dozen Chinese manufacturers hand-picked by the Chinese government. The U.S. government's letter is said to have been signed by Secretary of Commerce Donald Evans, Secretary of State Colin Powell and the White House Trade representative Robert Zoellick.

## Windows XP service pack carries caveat

When Microsoft releases Service Pack 2 for Windows XP later this year, some software developers might find their applications no longer work on updated Windows machines. Microsoft has made something of a trade-off with the update, focusing on security improvements at the expense of backward-compatibility.

The firm is calling on developers to test their code against the beta version of SP2 or face the possibility that the update will break their handiwork. XP SP2 is more than the usual roll-up of bug fixes and updates. It is also being used to make significant changes to the software to improve security. These changes can render applications inoperable, Microsoft warns. "It may surprise some of the developers that we are changing some defaults, and that may affect the way some of the older applications run," says Tony Goodhew, a product manager in Microsoft's developer group. Microsoft has created an online training course that details the implications of installing SP2 on XP machines.





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# Linux to star at Novell conference

■ BY DENI CONNOR

Attendees heading to Novell's annual BrainShare customer conference later this month should anticipate the company announcing a variety of products designed to flesh out its Linux strategy.

Having acquired Linux desktop vendor Ximian and the industry's No. 2 Linux vendor, SuSe, over the past year, Novell is expected to tighten integration between those companies' products and its own.

"What you are probably going to see is [the company] bringing together some pieces of the acquisitions coupled with [Novell's] security, identity management and Extend strategies," says Earl Perkins, a vice president at Meta Group. "They are trying to put together a vision that brings together the Linux server and desktop and their security and identity management play."

According to sources, among the previews Novell is expected to make at BrainShare are:

- The integration of Novell's ZENworks management suite and Ximian's Red Carpet Enterprise. The company already has placed ZENworks and Red Carpet Enterprise under the Novell Resource Management umbrella but not yet integrated them into one product.

- Details of a future unified collaboration package that includes GroupWise, iFolder, Novell's standards-based NetMail and Messenger, its instant-messaging package.

- An upgrade of Nterprise Linux Services for small and midsize businesses, which makes it easier to deploy and is less expensive. Nterprise Linux Services consists of eDirectory with DirXML, iFolder, iPrint, NetMail, Extend, ZENworks and ZeroG, an installation service.

- Details of the Novell Collaboration Solution for Linux, a collection of Linux products that includes GroupWise 6.5 for Linux, the Ximian Desktop 2, Ximian Evolution and GAIM, an instant-messaging product. Ximian Evolution is an e-mail, calendaring, meeting scheduling, contact management and task-list package for Linux and Unix. GroupWise 6.5 is presently in beta test.

- Upgrades across its Extend and identity management product lines.

- Two new Linux certification programs and a project to make an open source version of iFolder.

- Confirmation that HP's ProLiant BL20p blade servers will support NetWare 6.5.

Novell declined to comment on its BrainShare announcements. The company says that as many as 25% of an expected 6,000-strong audience will be first-time attendees drawn by an interest in Linux.

When Novell unveiled its Linux plans at last year's BrainShare, users said they hoped the company wouldn't domineer other open source vendors.

"Novell really has to embrace the Linux community; they can't afford to alienate them," says John Enck, vice president and research director at Gartner. "It's definitely a tricky thing for them to pull off to keep their current base happy, but still open their arms and make the Linux people feel welcome and loved."

Customer reaction to Novell's Linux push has generally been positive.

"The whole Linux foundation is such a great direction for Novell," says Gary Hensley, director of IT for beverage company Odwalla in Half Moon Bay, Calif. Hensley has NetWare and Windows servers. "It should put them in a great position to compete."

"Moving GroupWise onto Linux is a good move strategically for Novell," says Joe Doupnik, professor of electrical and computer engineering at Utah State University in Logan. "The more support we have for it, the better." Doupnik has at least 1,000 Linux servers installed in his environment. ■

## Betting on Linux

Last year Novell plunked down more than

**\$250 million**

for Linux acquisitions Ximian and SuSe.

# Companies take cover as worm war breaks out

■ BY ELLEN MESSMER

An Internet gang war of sorts broke out last week as the creators of two mass-mailer computer worms battled to outdo each other by releasing a dozen variants of the worms, called Bagle and Netsky, in rapid-fire fashion.

The conflict had corporations doing what they could to stay out of the crossfire.

The barrage of Bagle and Netsky variants appeared to pit rival virus writers in Germany and the Czech Republic who exchanged often-misspelled taunts with their code, such as "don't ruine our busssiness" and "wanna start a war?"

In addition, two new versions of the MyDoom worm appeared, and a wholly new one, Hiton.A. This unusually wormy week had anti-virus vendors and their customers stuck in rapid-response mode.

"This is the most variants we've seen released in a particular week," says Alfred Huger, senior director of engineering at Symantec Security Response, adding it far outstripped anything he could recall. "It's so prolific, it's affecting mail servers, making them go down."

Like other anti-virus vendors, Symantec went into overdrive, sorting out which variants required a signature update that customers would need to apply as quickly as possible to desktops, servers and other gateways.

"Because they're coming out so fast and furious, the need to stay updated is paramount," says Matt Marchionne, data security specialist at Burlington Coat Factory in Burlington, N.J. The retailer uses Eset Software's desktop anti-virus software.

Burlington Coat Factory doesn't leave it up to its employees to decide when to get updates from Eset servers. Instead, each user's computer automatically checks the Eset update server at regular intervals. When there's a barrage of worms, as there was last week, the company's IT staff re-sets the automated update to tighter intervals — from a day to an hour or even less — even though it can take up internal network capacity.

Increasingly, companies appear unwilling to rely on anti-virus

## Chasing worm variants

**The proliferation of worms and their variants has taxed anti-virus efforts:**

- Outbreaks have security professionals in "emergency mode" all the time.
- More decisions required as to whether a variant is different enough to warrant a signature update.
- Concerns mount over worms concealed in password-protect ZIP files, which anti-virus software can't open.
- Organizations spurred to look beyond anti-virus software to stop barrage.

software alone to protect themselves against worms.

One firm, Triplos, a St. Louis company that makes products for the pharmaceutical industry, battens down its network by not granting users access until they have passed an inspection to assure they have updated anti-virus software on their machines. Triplos does this using a policy-management appliance called CyberGatekeeper and the desktop CyberArmor firewall from InfoExpress.

"We set policies that laptops have to have updated anti-virus," says Nathan Burns, network security administrator at Triplos. Users within the network or remotely accessing it will be directed to update their anti-virus software — Triplos uses Symantec — if their computers don't pass inspection.

## Making matters worse

To make matters worse last week, a number of the Bagle variants were discovered concealed inside password-protected ZIP files. These ZIP files aren't stopped through the usual anti-virus scanning process.

"The simple rule is, [anti-virus software] can't look inside a password-protected ZIP file; [it has] to look at it in order to recognize a specific fingerprint," says Jimmy Kuo, McAfee research fellow. He adds that Windows XP, which includes a

way to let users double-click to read headers on ZIP files, unfortunately makes it easier for users to be fooled by tricks that virus writers come up with to dupe people into opening ZIP attachments.

Some corporations say banning incoming attachments entirely is one way to add protection against worms.

"Netsky is one of the big ones right now," says Bob Wood, senior network analyst at Skokie, Ill., map publisher Rand McNally, about last week's mass-mailer worm wave. "But we just don't allow attachments that would damage our computers."

Wood says the company adopted the approach after getting slammed a few years ago in a mass-mailer worm outbreak.

Another firm, Daniels Trading, a commodities exchange in Chicago, says anti-virus software just isn't enough when worm attacks are coming so fast. According to COO Glenn Swanson, the company also relies on Cisco's behavior-blocking software, Cisco Security Agent, to stop worm activity on desktops.

"The software stops suspicious behavior — for instance, you can't grab a whole e-mail list and send it out," Swanson says. While Cisco Security Agent has halted many worms in their tracks, Swanson notes that virus writers are getting more crafty. At least one Netsky variant grabs a limited number of e-mail addresses at a time.

The worm wars are making some angry, calling for tougher law enforcement response.

"It's hard to imagine a more comical situation: A handful of virus writers are playing unpunished with the Internet, and not one member of the Internet community can take decisive action to stop this lawlessness," says Eugene Kaspersky, head of anti-virus research at Kaspersky Labs in Moscow.

He predicts the worm wars will continue until there's more effective prosecution of virus writers. ■





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# SCO takes Linux battle to users

■ BY JENNIFER MEARS

The SCO Group has stepped up its campaign to protect its intellectual property rights by making good on a promise to take aim at end users, but despite the flurry of legal activity last week customers and industry observers remain steadfast in their support of Linux.

"We, along with the rest of the Linux community, have been waiting for this," says Joe Poole, technical director at Boscov's Department Stores in Reading, Pa., which runs SuSe Linux. "It really has become a non-issue because nothing has been proven."

On Wednesday, the same day SCO announced a \$2.2 million loss on revenue of \$11.4 million, the company said that it had filed a pair of lawsuits: one regarding copyright violations in Linux against AutoZone, and the other claiming breach of contract in a Unix software agreement with DaimlerChrysler.

The first lawsuit, filed in U.S. District Court in Nevada against AutoZone of Memphis, Tenn., centers on SCO's claim that Unix code — which the company says it owns — has illegally been ported into Linux. In the suit, SCO says AutoZone is "running versions of the Linux operating system that contain code, structure, sequence and/or organization from SCO's proprietary Unix System V code in violation of SCO's copyrights."

The second lawsuit, filed in the Oakland County Circuit Court in Michigan, says DaimlerChrysler failed to meet the terms of a Unix software agreement it holds with SCO. The lawsuit is based primarily on SCO's claims the Auburn Hills, Mich., automaker "refused to provide the certification of compliance with the 'provisions' of the software agreement."

A DaimlerChrysler spokeswoman said the company has not yet been served with the lawsuit and could not comment. AutoZone declined to comment.

SCO's plan of attack is obvious, observers say: Put pressure on Big Blue. According to the IBM Web site, DaimlerChrysler runs IBM pSeries servers. It also runs a Linux cluster on IBM workstations. AutoZone is an IBM customer as well.

"This is all part of SCO's continuing strategy to put pressure on IBM," says Jeffrey Neuburger, an

intellectual property attorney at Brown Raysman Millstein Felder & Steiner. "One effective way of putting pressure on a company is by suing its customers in an intellectual property issue."

Meanwhile, three companies, including Computer Associates, last week confirmed they had each purchased an Intellectual Property License for Linux. SCO first made the licenses available last summer for \$699 per server as a way of letting companies running Linux protect themselves against possible litigation (see graphic, page 13).

Computer Associates, a staunch supporter of Linux and a founding member of the Open Source Development Labs, says it purchased the license as part of a \$40 million settlement reached in August in a breach of contract dispute with technology incubator Canopy Group and one of its offshoots, Center 7. Canopy Group

is a major investor in SCO.

"CA disagrees with SCO's tactics, which are intended to intimidate and threaten customers," says Sam Greenblatt, senior vice president and chief architect of the Linux Technology Group at CA. "CA's license for Linux technology is part of a larger settlement with Canopy Group. It has nothing to do with SCO's strategy of intimidation."

SCO CEO Darl McBride is hoping that filing end-user lawsuits will persuade more Linux users to purchase SCO's intellectual property licenses. He likened his company's legal efforts to those of the recording industry as it sought to end the illegal download of copyrighted music.

"We anticipate that there are many end users that have not considered the ramifications of the unlicensed use of SCO copyrighted technology and that an increasing number of companies

will now take the appropriate action to license SCO's intellectual property," he said during a conference call last week.

Analysts and attorneys doubt that will be the case. For one thing, they say in the music industry case it was clear who owned the copyrighted material. Things aren't so clear with SCO. SCO is in litigation with Novell over who actually owns the copyrights to Unix. The initial Unix intellectual property rights case, which was filed against IBM a year ago, is progressing. IBM last week was ordered to show SCO specific Unix code that might be in question. SCO, in turn, was ordered to point out exactly

See SCO, page 13

■ For more Linux news, see PAGE 15

## Customers: Ebbers charges send a message

■ BY DENISE PAPPALARDO

News that former WorldCom CEO Bernie Ebbers faces criminal charges for his role in the country's worst accounting scandal is being cheered by customers and industry experts who see accountability as key to discouraging future shenanigans.

Ebbers was charged last week with three federal counts stemming from the company's more than \$9 billion accounting scandal that came to light in July 2002. Soon thereafter, the company, now called MCI, filed for the largest bankruptcy in U.S. history.

"Capitalism is founded on an institution of trust that's been shaken," says Johna Till Johnson, president at consulting firm Nemertes Research and a *Network World* columnist. "Bernie doing the perp walk brings a little more confidence back to the system."

Until last week, it wasn't clear whether Ebbers was going to be charged. But the carrier's former CFO Scott Sullivan accepted a plea arrangement earlier in the week that seemed to have sealed Ebbers' fate.

"We champion any effort by the [Department of Justice] or whomever, to set an example of these wrongdoings," says Dayne Sampson, vice president of IT for Ask Jeeves and also an MCI customer. "We are happy to see it."

Although he thinks bringing Ebbers to justice is the right thing to do, he also thinks MCI, which is expected to emerge from bankruptcy in April, could suffer a backlash.

"MCI is doing its best to drag itself out of the mud, and this is probably going to drag them back," Sampson says. "There are a lot of decent people who work there."

The company has tried to distance itself from the scandal that brought it into bankruptcy.

Others are hopeful that some good will come from the fact that specific executives are being held accountable.



Former WorldCom CEO Bernie Ebbers, center, is escorted by federal agents after turning himself in last week on charges of conspiracy to commit securities fraud and making false statements to the Securities and Exchange Commission.

"The indictment of Bernie Ebbers and recent legislation like Sarbanes-Oxley Act should discourage other telecom executives from fraudulent accounting practices," says Bill Strickland, network services national manager at Toyota Motor Sales USA and an MCI IP VPN customer.

"Over time [charging Ebbers] should result in investor confidence returning to the telecom sector. A conviction could expedite the recovery of MCI and help bring closure to the loss experienced by stockholders and employees of MCI," he says. ■



### THIS WEEK'S QUESTION:

Don't confuse him with the former pro basketball star, but Michael Jordan serves as chairman and CEO of one of the top Network World 200 companies. Which one?

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# IBM targets vertical markets, SMBs

Big Blue uses PartnerWorld event to showcase integration tools.

■ BY ANN BEDNARZ

LAS VEGAS — Users can expect to see more products from IBM flavored with industry-specific capabilities and aimed at midsize companies. At least that's the message from IBM's most senior executives, who turned out last week to woo some of Big Blue's 90,000 business partners — a lucrative sector responsible for \$29 billion of IBM's \$89 billion 2003 revenue.

CEO Sam Palmisano, a rarity on the keynote circuit, kicked off IBM's PartnerWorld conference, stressing that IBM and its partners need to deliver what customers want: integrated, standards-based systems as opposed to the propri-

etary, piecemeal technologies of the past. "The client is insisting on simple, standardized approaches. They no longer want to be the self-integrator," he said.

A number of IBM's new initiatives are aimed at freeing customers' IT resources, which today are consumed by mundane systems — and application integration work. If the integration burden is removed, customers can focus more on strategic development projects to drive their own revenue growth, which will spur IT spending, Palmisano said.

To that end, IBM announced two tools designed to make it easier for users to identify and respond to business events. The

first is Common Event Infrastructure (CEI), software designed to integrate events from routers, servers, applications and databases into one console. The goal is to help IT managers identify and track the correlation between a business activity such as a sluggish payment validation process, and a systems bottleneck such as an unresponsive server.

The second is the Orchestration and Provisioning Automation Library (OPAL), a collection of automated workflows for installing, configuring and deploying key system and business processes. With the help of partners, IBM plans to populate OPAL with scripted workflows for stor-



EPA/GEORGE FREY

**“Seldom does anybody vote for a new idea. You have to push it out there.”**

**Robert Redford**

President of Sundance Institute, speaking on the subject of innovation at IBM PartnerWorld.

age, servers, applications and middleware, and processes tailored to industries such as banking, retail and healthcare.

Initiatives such as CEI and OPAL illustrate IBM's commitment to partnering, says Paul Mason, group vice president for infrastructure software research at IDC.

"These initiatives show that even a company with the breadth of resources IBM has can't do everything on its own," he says. "IBM doesn't have the domain expertise in vertical industries or the close contact with customers that some partners have."

## Prolific partners

IBM's network of independent software vendors (ISV), distributors and resellers handle a significant percentage of Big Blue's customers, many of which are too small for IBM to reach cost-effectively through direct sales. Last year, partners drove 61% of IBM's server revenue, 58% of storage revenue, 50% of small and midsize business (SMB) revenue and 23% of software revenue. Together, partner-generated revenue is growing fast, up 16% to \$29 billion in 2003, according to Mike Borman, general manager of global business partners at IBM.

Looking ahead, IBM wants to focus its partner resources in two key areas: creating industry-focused offerings and capturing SMB market share.

Industry expertise is an ongoing push of IBM. Last year, IBM reorganized its sales teams around industries and started issuing dozens of vertically focused middleware products. It now offers 62 industry-branded integration products, according to Steve Mills, senior vice president in charge of IBM's software group.

At PartnerWorld, IBM announced it is extending this vertical orientation to its ISV partners. Meanwhile, SMBs represent a

\$300 billion opportunity, according to Marc Lautenbach, general manager of SMB for IBM. There are 500,000 businesses with between 100 and 999 employees that will spend \$173 billion on IT, and millions of businesses with fewer than 100 employees that will spend \$126 billion on IT, Lautenbach said.

IBM says it hopes to lure some of those dollars with its growing SMB portfolio. New to the mix is Integrated Runtime, a stack of pre-configured IBM middleware — including WebSphere Application Server Express and DB2 Universal Database Express — aimed at simplifying deployment.

On the research front, IBM is working on SMB-oriented projects such as wizards to make it easier for systems integrators to link IBM technology, Lautenbach said. OptimalGrid, which automates certain grid computing setup tasks such as enlisting computing nodes and delivering code, also is aimed at SMB users.

Actor, director and entrepreneur Robert Redford, a keynote speaker at PartnerWorld, applauded IBM and its partners' support for SMBs, which he described as a threatened species in today's world of corporate mergers and acquisitions.

Consolidating markets take away options and diversity, Redford, president of the Sundance Institute, said. If instead of combining, companies could stay independent and branch out through partnerships, "then I think you're keeping alive the ability to be flexible," he said.

He encouraged attendees to think creatively, take risks and champion new ideas. "Seldom does anybody vote for a new idea. You have to push it out there," Redford said.

Senior Writer Denise Dubie contributed to this report.

## Wireless LAN industry starts raising antennas over MIMO

■ BY JOHN COX

Wireless LANs soon will start doubling or more in throughput and range if a smart antenna technology dubbed MIMO pans out as its backers anticipate.

Multiple-input-multiple-output, or MIMO (pronounced "my-moh" or "mee-moh"), has made its way into chipsets and could be in WLAN devices by year-end.

"Everybody is working on this," says Craig Mathias, principal with wireless consultancy Farpoint Group. "It's the most important radio technology for the next few years."

MIMO algorithms in a radio chipset send information out over two or more antennas. The radio signals reflect off objects, creating multiple paths that in conventional radios cause interference and fading. But MIMO uses these paths to carry more information, which is recombined on the receiving side by the MIMO algorithms.

Many WLAN vendors expect that some form of MIMO will be the basis of work just starting in the IEEE 802.11n Task Group, which is creating a specification for WLANs having at least 100M bit/sec throughput. The 3rd Generation Partnership Project, a collaboration of telecom standards groups, also is evaluating MIMO techniques for use in cellular networks.

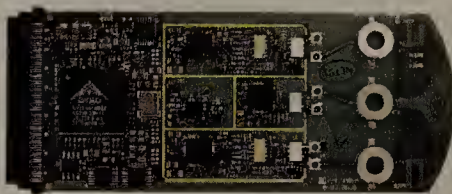
Part of the enthusiasm for MIMO is based on the conviction that it can dramatically boost performance and range, and still handle existing 802.11a/b/g radios, with only a slight initial increase in price over those products.

The Holy Grail in radio technology is increased spectral efficiency, or how many bits per second per

## Making a difference

**MIMO supporters say the smart antenna technology (such as Airgo's card shown here) could have a dramatic effect on enterprise wireless LANs, such as by:**

- Reducing the number of WLAN access points needed per site.
- Lowering installation and cabling costs.
- Increasing network reliability.
- Supporting more demanding applications.



hertz pass through the air, Mathias says. MIMO doubles the spectral efficiency compared with that of current WLANs. The maximum data rate for 802.11g and 802.11a networks is 54M bit/sec, though actual throughput is closer to 20M to 30M bit/sec. Current MIMO techniques can boost raw WLAN throughput to 108M bit/sec, supporters say.

So far, the only company with MIMO chipsets is Airgo Networks. Former Stanford University researchers Greg Raleigh and V.K. Jones, who hammered out some mathematical proofs for MIMO and multipath, founded this Palo Alto radio chip designer.

One leading WLAN vendor has tested Airgo products for six months and has decided to use MIMO in products due out by year-end. "Our engineers found a 200% to 400% increase compared to the performance of other [802.11] products," says a vice president with this vendor who requested anonymity. "They found a 150% to 300% increase in range."

Right now, MIMO's range increase is the decisive feature for the vendor, so a WLAN access point can

See MIMO, page 53



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## Modem

continued from page 1

date in July with Cisco, Intel and others.

But the little-known story behind his fast modem invention is that he came up with the idea in 1993 while building an appliance for downloading music from servers over direct-dial phone connections. His Music Fax system looked to be a precursor of file-sharing systems — and lawsuit magnets — such as Napster and Kazaa.

Working on Music Fax, Towns-

hend recognized that modem speeds were too slow for real-time playing of songs. Early MPEG could transmit good sound at 50K to 60K bit/sec, but the fastest modems topped out at 33.6K bit/sec.

Townshend noticed that downloads from servers connected to the phone network via digital links, such as T-1s, could reach 56K bit/sec because they didn't have to undergo speed-sapping analog-to-digital conversions. Uploads required these conversions, limiting speeds to 33.6K bit/sec. He patented technology

essential to making fast-down, slow-up modems.

"I said, 'This is an easy thing to do. I can just license this to people that are in the modem business. I don't have to start competing with them or set up my own distribution,'" Townshend says.

His patent claim came as a horrible surprise to International Telecommunication Union members working on a 56K bit/sec modem standard in 1996. At a meeting, word came out that Townshend not only filed for a patent but had already licensed his ideas to modem maker U.S. Robotics.

"Everyone was a little upset that this pops out at what felt like a late time in the process and hadn't come up to the surface before," says Ken Krechmer, a member of that ITU committee. "It really created an enormous mess."

When Townshend showed up at the next ITU meeting, everyone took note. "I wanted to get a sense of the guy and what he thought he was doing," Krechmer says. "I got the impression of a good, solid technical guy, a good applied mathematician who saw that there was a really interesting way to solve a specific problem and decided to patent it."

The 44-year-old Townshend, who has licensed his technology for millions of devices, presented reasonable terms and the ITU work went ahead. (Licensing fees have dropped from as much as \$2.50 per modem to as little as 22 cents per modem between 1999 and today.)

He wouldn't detail how much he has reaped in modem license fees over the years. But with analysts estimating that roughly 100 million 56K modems were sold in each of the past two years, figure he's getting at least \$22 million a year in license fees based on a 22-cent fee per soft modem.

## Born to invent

The path that led him to that day started back in high school in his hometown of Toronto. He developed a cottage industry — building signal-processing boxes for University of Toronto researchers so their lab computers could talk to their electronic measurement gear.

"These people must have been amazed at the deal they were getting because they'd come and get me to build the thing and I'd spend a month and charge them \$400," Townshend says.

He went on to earn a Ph.D. in electrical engineering from Stanford University in 1987. His thesis adviser, Robert White, says Townshend's contribution to a prosthesis project enabled the research group to focus electrical impulses on human auditory nerves without having the electrodes come in contact with the nerves themselves.

"He made a very clever realization that an existing principle would apply to our case," White says. "It was one of those 'why didn't I think of that' kind of ideas."

Also in 1987 Townshend joined Bell Labs, where he worked until 1990 studying speech recognition and low-bit-rate speech encoding to make the most of cell-phone bandwidth. Then he moved to Montreal to start Townshend Computer Tools, which developed Dat Link, a signal processor for making high-quality audio recordings that it sold through several companies, including Entropic Research.

He also developed a system called Griffe for certifying the authenticity of faxes. But Music Fax and the 56K bit/sec modem came along, derailing Griffe.

In 1993 in the midst of the Music Fax work he moved Townshend Computer Tools to Menlo Park, Calif., where he shared space with the West Coast office of Entropic, which was run by Jared Bernstein.

When Bernstein incorporated Ordinate, a speech-assessment software company in 1997, he lured Townshend to serve as CEO. Ordinate's PhonePass product is used to evaluate how well non-native English speakers have learned to speak the language.

Bernstein says his colleague has changed very little since they met. He dresses a little better. Soon after Townshend started licensing modems, he bought a new home, but not an ostentatious one. Bernstein says a film crew that shot a documentary on Canadians who made it big in Silicon Valley didn't film Townshend's house because it didn't fit with the image of success they were portraying.

His former adviser, White, says Townshend remains modest. Townshend attended a reunion of graduate students but never let on the level of success he achieved with the modems. ■



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## SCO

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which code in Linux might have come from Unix.

"There's nothing in copyright law that requires me to pay for a license just because someone says he has a copyright while at the very same moment he's suing somebody else who says he doesn't," says Eben Moglen, professor of law at Columbia University and general counsel of the Free Software Foundation. "So I have to say despite all this rumbling from SCO ... things are pretty much where they were before. SCO against Novell means nobody actually is sure that SCO owns anything."

Meanwhile, SCO's legal fees are mounting: it reported costs of \$3.4 million in the first quarter alone associated with protecting its intellectual property. At the same time, it reported collecting just \$20,000 in revenue from licensing efforts during the quarter.

"They're just widening the number of people they are engaged in litigation with, and it does not prove their points," says Dan Kusnetzky, vice president of system software at IDC. "What it does is take their limited amount of revenue and direct it toward litigation rather than creating and maintaining products. ... If you look at the escalating costs and decreasing revenue, there has to be a point where the revenue does not support the escalating costs of litigation, and when that day comes they will no longer be able to continue either litigating or being in business." ■

## Paying up

**The SCO Group, which claims it owns intellectual property that was illegally ported into Linux, is asking users to pay up or face litigation. SCO says its efforts resulted in revenue of \$20,000 in the most recent quarter. A look at companies that are responding to SCO's demands:**

- Computer Associates says that it purchased an Intellectual Property License for Linux from SCO as part of a \$40 million settlement in August in a breach of contract dispute with Canopy Group, a major SCO investor.
- Energy firm Questar says it recently bought an IP license from SCO to cover seven servers running Linux in a network of more than 100 boxes.
- Manufacturer Leggett & Platt says it, too, purchased an IP license for "a small number of remote locations running Linux."
- Hosting company EV1Servers.net, which manages more than 20,000 servers, also bought an IP license, reportedly worth more than \$1 million so that its current and future customers "can enjoy peace of mind."
- In May, Sun and Microsoft purchased Unix license agreements and paid SCO nearly \$26 million last year, representing nearly one-third of SCO's revenue for 2003.

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## Takes

■ The **IEEE** last week approved a standard for 10G Ethernet over copper, opening the way for short-reach, high-speed data center links that are more affordable to corporations. The **802.3ak standard** will be implemented as 10Gbase-CX4, providing 10G bit/sec over dual twin-axial cables, similar to the cabling used in InfiniBand environments. Experts say 10Gbase-CX4 ports will be more affordable to companies than current fiber-based 10G ports, which average \$10,000 per port, according to the Dell'Oro Group. The 10G Ethernet originally was designed as a long-haul carrier technology, specifically for replacing SONET OC192 in metropolitan-area networks with Ethernet. However, as companies began showing interest in 10G and carriers cut back spending during the telecom bust, interest began to grow in a short-haul version of 10G for switch-to-switch interconnects.

■ **Maxxan** announced two virtual tape systems that use disk to emulate tape libraries. The **SVT200** virtual tape system is a blade that fits in Maxxan's MXV320 Intelligent Application Switch. The SVT100 is a stand-alone appliance for midrange storage environments. Both use FalconStor's IPStor Virtual Tape Library software. They use Fibre Channel to back up and recover data more quickly. The SVT200 and SVT100 also work with a variety of back-up applications from Computer Associates, HP, Legato Systems and Veritas Software, among others. The appliance and blade are priced starting at \$39,000 and \$34,000, respectively.

■ **Stonefly Networks** is announcing **Stonefly Backup Advantage**. The suite of products includes a Stonefly Storage Concentrator i3000, Commvault's Galaxy Express backup, an iSCSI driver, 1T byte of Advanced Technology Attachment storage and remote data replication capability. Stonefly Backup Advantage starts at \$29,800.

# Moving Linux to the desktop

■ BY JENNIFER MEARS

Increasingly, businesses, government entities and schools are starting to look beyond Windows, which IDC says securely dominates the desktop market with a 94% market share. Instead they're considering running Linux as their client operating environment. But the move is a slow one.

While organizations see big cost savings in casting off proprietary licensing fees, many challenges remain, including the lack of application support and a reluctance within companies to move from an established operating system to one that is unfamiliar.

An SG Cowen survey of more than 500 North American companies last year found that of the 80% of respondents that were using Linux, only 15% were using it on the desktop.

"While that may sound healthy, it represents less than 5% of the PCs across the whole survey base, and less than 0.5% of the PCs among larger organizations," the report says.

But interest is growing, as vendors such as Sun and Novell focus on their Linux desktop offerings. IBM also sees budding demand, and an internal memo leaked to the press in January indicated that Big Blue planned to move all employee desktops to the open source operating system by 2005. A spokeswoman downplays the company's intent.

"We have no plans in place to migrate all our employees to Linux desktops. We have just begun the work to determine whether this might make sense," she says.

But it's important to note that IBM is looking at Linux as a client operating system. Users say there are some real benefits. Governments in particular are turning to Linux for cost savings, as well as for reliability and stability. And with Linux, customers are not tied to a predetermined package of desktop tools and can mix and match according to their needs. Linux runs a variety of open source programs, including Gnome, K Desktop Environment (KDE), StarOffice and OpenOffice productivity suites; Mozilla browser; and Evolution mail and calendar.

Four years ago, the city of Largo, Fla., decided to expand its use of Linux, which was deployed on servers in the late 1990s, to reduce the costs associated with running a Unix client operating system.

See Linux, page 16

## Going mainstream

**Linux has hit the big time when it comes to server operating systems, but what about the desktop? Some issues to think about when considering using Linux as a client operating system:**

Pros:	Cons:
<ul style="list-style-type: none"> <li>● <b>The money.</b> The open source option frees you from costly licensing fees.</li> <li>● <b>Flexibility.</b> With Linux, IT can pick and choose what users can access.</li> <li>● <b>Business control.</b> Not ready to update or add patches? Linux doesn't force a schedule.</li> <li>● <b>Adaptability.</b> Especially when considering thin-client deployments, Linux fits in nicely with heterogeneous systems.</li> </ul>	<ul style="list-style-type: none"> <li>● <b>User reluctance.</b> Employees used to their Microsoft desktop may not easily switch.</li> <li>● <b>Application limitations.</b> Many enterprise applications have not yet been ported for Linux desktops.</li> <li>● <b>Peripheral incompatibility.</b> Network cards, sound cards and other peripherals that worked fine with Windows might not be supported by Linux or might need drivers that aren't easily located.</li> <li>● <b>Techie reputation.</b> Linux faces the same challenges on the desktop as it initially faced on the server: It's considered too techie. But companies such as Sun and Ximian are working to provide more user-friendly front ends.</li> </ul>

# IBM survey: Training, tech needed to grow revenue

■ BY ANN BEDNARZ

NEW YORK — Revenue growth is the top corporate priority, but a lack of technology tools and skills stands in the way of achieving it, according to a new IBM study.

IBM's Business Consulting Services division surveyed 456 CEOs, a majority through in-person interviews, to catch a glimpse into corporate planning agendas. Among the respondents, 80% say increasing revenue is their primary objective. Notably, the push for revenue growth has supplanted cost-cutting efforts, which dominated CEO agendas in recent years.

As economic trends have begun to improve, CEOs are satisfied with the cost-containment measures put in place over the last two years and are ready to focus more aggressively on new opportunities, IBM says. Achieving growth won't be easy, however. One obstacle is a perceived lack of responsiveness. Most CEOs say their companies are not agile enough to identify and chase new market opportunities.

Among respondents, 80% cite the ability

to respond rapidly to changing market forces as a high priority in the next few years. Only 13% of CEOs rate their organizations as "very responsive" to changing business conditions. In addition, 43% of CEOs rate their company's change-management record as unsuccessful.

Joseph Reiser, CEO at Locus Pharmaceuticals in Blue Bell, Pa., says it's a challenge to be responsive. The nature of the pharmaceutical industry requires Locus to anticipate patient needs and commit research-and-development resources to particular drug design projects years before the drugs will become available to consumers.

Technology helps the company compress the time and cost of drug development — although it's still a massive undertaking that can cost up to \$1 billion for one drug. Locus recently signed a deal with IBM to outsource some computation work that's done on a 2.3 teraflop IBM supercomputer. Locus needs the supercomputer to perform continually evolving design

See IBM, page 16



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**Y**ou might be familiar with the cliché that the cure can be worse than the disease. When it comes to patching software, Microsoft's David Aucsmith now appears to be saying that the cure is frequently the cause of the disease.

Addressing the E-Crime Congress organized by Britain's National Hi-Tech Crime Unit, Aucsmith — of Redmond's Security business unit — was reported by the BBC to say that crackers are, essentially, lazy louts who wait for a security patch to be released and then reverse-engineer it to find the vulnerability. Unpatched systems

## Patching: The cure that's worse than the disease?

then can be compromised. He cited the recent critical problem dubbed "ASN.1," which was discovered in July 2003 but for which a patch wasn't issued until last month. He said the first exploit of the vulnerability didn't occur until three days after the patch was released.

Following his argument to its invariable conclusion, it would appear that the best course would be never to issue a patch at all. That way, the lazy crackers would have nothing to work with.

I'll go along with the thought that most of today's nefarious hackers (and they have brought into ill repute what was once a term of respect) are lazy. But I think they're too lazy even to do a spot of reverse-engineering. All they need to do is to read the Microsoft Knowledgebase article detailing the extent and cause of the vulnerability to help them create an exploit by adapting

someone else's real hacking work.

The BBC (www.nwfusion.com, DocFinder: 1024) also quoted Aucsmith as saying "We have never had vulnerabilities exploited before the patch was known." But a few paragraphs later, the story reports that Aucsmith said he could only think of one instance when a vulnerability was exploited before a patch was available. There's a long way from a categorical "none" to an admission of one and the actual truth, which is "at least a handful."

His solution, by the way, wasn't to stop issuing patches but for users to apply them more quickly so as to limit the window the lazy crackers have to do damage. All that's left is for Aucsmith to tell us how to limit the damage ill-advised patches often do.

*Kearns, a former network administrator, is a freelance writer and consultant in Silicon*

*Valley. He can be reached at wired@vquill.com.*

### Tip of the Week

**S**teve Ballmer is always good for a catchy line, but rarely one that **NetWare** stalwarts might agree with. But in telling Canada's eChannelLine (DocFinder: 1025) why Windows was the only viable operating system, he dismissed NetWare by saying "even Novell is trying to get off of the Novell platform and onto Linux."

### Linux

continued from page 15

"New applications and open source software were becoming available on Linux," says Harold Schomaker, the city of Largo's IT manager and CIO. "This makes it easier to replace servers once they have reached end of life [because Linux can run on multiple hardware platforms]. Also, the staff skill set migrated fairly easily."

The city had tested Windows, but because many of its applications ran on Unix, the city had to use Citrix Unix Integration Services to emulate the applications on the Windows PCs. There were just too many headaches, Schomaker says.

With city employees connecting through thin client devices to a Linux desktop they now have access to all the applications they need, whether they are open source, Unix or Windows-based.

"Since we deliver every application regardless of platform to the desktop through the thin client, [Linux] makes it really easy," Schomaker says. With Linux, no emulation code is necessary to connect into heterogeneous applications, he adds.

Schomaker says Linux provides better stability and lets him avoid the headache of installing frequent patches as he would with Microsoft. What's more, with Linux running in a thin client environment, the city saves as much as

\$400,000 per year.

Despite possible cost savings, some organizations turn away from Linux on the desktop because they consider it "too techie." In an effort to get around that image, the open source community is working to make interfaces for Linux desktops more user-friendly. For example, the KDE project, recently released the latest version of its open source desktop environment with features to improve usability and performance. Some Linux desktop distributions — the SuSe Linux Desktop, for one — support Microsoft Office, which makes the transition to Linux less painful for end users.

IDC predicts that Linux in both

server and client operating environments will continue to grow at a faster rate than any other operating environment. On the client side, paid shipments of Linux held a 1.7% share in 2000, but grew to 2.8% in 2002, a tenth of a percent behind Apple. IDC predicts that Linux will be in the No. 2 spot when the 2003 data is tabulated, says Dan Kusnetzky, vice president of system software at IDC.

The Open Source Development Labs (OSDL), a consortium focused on honing Linux for corporate use, recently formed a desktop Linux working group with the aim of creating a framework to help IT managers deploy Linux as a client operating system. The working group was created in response to the organization's user advisory council, made up of Global 500 companies. Tim Witham, OSDL lab director, says the companies in the user advisory council all are doing some type of prototype deployment with Linux on the desktop. He declined to say who those companies were.

Freedesktop.org, HP, IBM, Intel, Novell, OSDL, Red Hat and Sun all are involved in the OSDL effort.

"The ultimate goal is to make sure that for people who want to deploy [Linux on the desktop], there is in essence a cookbook: 'We know this works and we can go forward with that,'" Witham says. "An overall goal of OSDL is to see that [independent software vendors] are in the position where they port once and run everywhere. ... I don't think we're at that point yet."

But things are moving in that direction.

"Except for those groups of

users within a business who only need minimal stuff like mail, word processors and a browser, there continues to be reluctance because most of the applications they need are not available on Linux," says Bill Claybrook, an analyst at Harvard Research Group. "But that will change. It's changing fairly quickly."

In Austin, Texas, the city government conducted a pilot project last year to test Linux. It currently has 5,200 Microsoft desktop licenses. But the city is facing a \$39 million projected deficit this year and Linux desktops could mean significant cost savings, says Pete Collins, Austin's CIO. But there also are challenges, he adds.

"When you're looking at some other sophisticated applications such as police and fire report management systems or computer-aided dispatch for public safety — and that's all Windows-based — then you start having some issues," Collins says.

Collins says the city is reviewing the results of the pilot project and plans to make a decision by year-end.

Analysts say the biggest uptick in the use of Linux as a client operating system is for developers who are writing Linux applications. But it also is making inroads for kiosk deployments and for transaction-focused workers in call centers and retail locations. ■

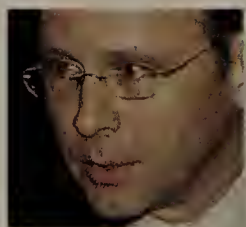
### IBM

continued from page 15

algorithms that only get more complex, Reiser said at an IBM event that announced the survey results. "Cost-cutting your way to success just isn't an option," Reiser said.

Skills deficiencies also pose an obstacle to achieving revenue growth, according to survey respondents. About 60% of CEOs said the major barrier to managing change-related projects is limited internal skills and leadership resources.

Bill Pence, CTO of online music company Napster in Los Angeles, agrees. "It's been harder to find good technical talent over the last 18 to 24 months," Pence said at the IBM event. In years past, the company had more qualified applicants than it needed, he said.



**“It's been harder to find good technical talent over the last 18 to 24 months.”**

**Bill Pence**  
CTO, Napster

The survey results will help IBM set its own priorities for future investments, said Ginni Rometty, managing partner of IBM Business Consulting Services. It also confirms ongoing investments IBM has made in areas such as business analytics, telematics and radio frequency identification technology, she said.

"It's heartening to hear CEOs telling us, indeed, they are going after growth and want to leverage all this information

and connectivity that is emerging to be more responsive," added Irving Wladawsky-Berger, IBM's vice president of technology and strategy. "Eighteen months ago, when we launched the On Demand initiative, these are the kind of market conditions and requirements we were hoping for."

IBM produced the CEO survey with support from Economist Intelligence Unit and Nikkei Research. ■



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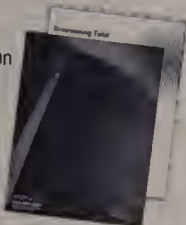


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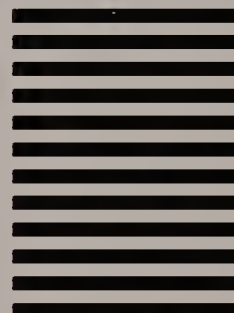
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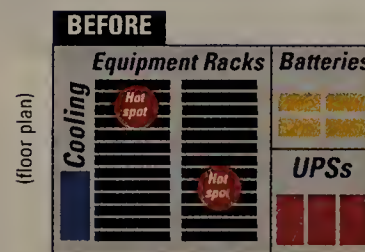
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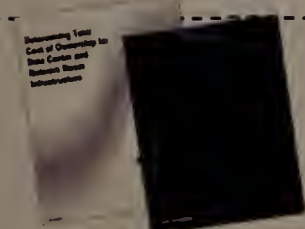
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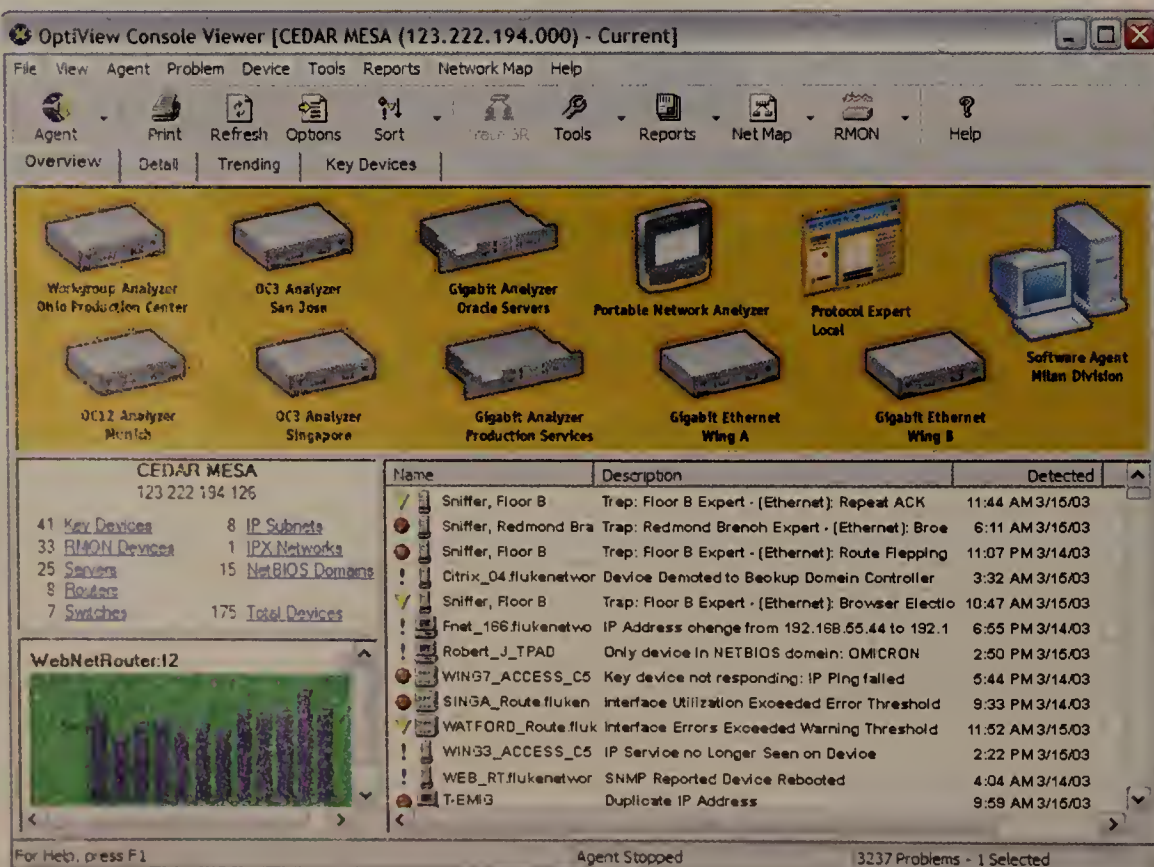
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## Microsoft's long road to security

Company makes progress, but experts and users say it still has a long way to go.

■ BY JOHN FONTANA

Two years after Microsoft Chief Software Architect Bill Gates vowed the company

### Short Takes

■ **Microsoft** and **eBay** last week delivered tools that enable links between the 2003 editions of Excel and FrontPage and the eBay online auction service. The tools will let frequent users of eBay's service manage their auctions using Excel, including the ability to analyze sales and upload multiple listings at once, Microsoft says. FrontPage users will be able to display information from eBay on Web sites created using FrontPage. The tools take advantage of XML capabilities in the 2003 editions of Excel and FrontPage, and Web services APIs made available by eBay. The tool set for Office 2003 will be offered on eBay's developer Web site ([www.developer.ebay.com](http://www.developer.ebay.com)) and the Microsoft Developer Network site.

■ **BMC Software** last week upgraded its **mainframe management software** with features that will give bandwidth and capacity priority to mission-critical IP applications running on a mainframe. **Mainview for IP 2.2** lets customers apply rules and policies to IP-based applications. BMC acquired Mainview from Boole and Babbage in 1998. The software is installed on a mainframe, and once configured and activated, it will begin reporting on application metrics such as number of IP packets, bytes and sessions. Also this week BMC is set to upgrade its **Mainview for CICS** (Customer Information Control System) software with a feature called application delay analysis that can pinpoint CICS applications performing badly and prevent any slow-down to business services. Mainview for IP starts at \$24,000. Mainview for CICS starts at \$33,000.

was making security its top job, users and experts say progress has been measurable but that a lot more work has to be done.

"There is a long way to go to make it easier for administrators to keep their networks secure," says Russ Cooper, moderator of the NTBugtraq mailing list and surgeon general for security company TruSecure.

Some say Windows must be simplified or transformed with a major code overhaul, that an alternative to pushing out patches might be needed and that automated patch management will have to show it's secure before it can help improve security.

Some say Microsoft also must focus on shoring up older software such as Windows 2000, given that the next major release of the operating system, code-named Longhorn, isn't expected to ship

until 2006 or 2007.

And foremost, Microsoft, which is a collection of autonomous product groups, must learn to work as one company when solving security issues.

"They are now seeing that coordination across the entire company takes a lot of time," says Michael Cherry, an analyst with Directions on Microsoft, an independent research firm. "Installing one product should not undo security of another product."

Cherry says security is driving change because it hit Microsoft on the bottom line. "The money companies spend fixing these problems is money they can't spend on new products."

Critics and end users say Microsoft will make some progress in the coming months when it ships Service Pack 2 for Windows

XP, which is designed to make the operating system more resilient by turning off some features by default and makes available a set of new patch management tools, including new installer and updating software.

Those improvements come in addition to those in Windows Server 2003, including additional security features to lock down key components such as Active Directory and Internet Information Server.

However, all these improvements, according to some, might be feeding the problem.

"They are layering on more complexity, not simplifying the code to make it more secure," says Dan Blum, an analyst with Burton Group. It's a philosophy Microsoft seems to have failed at when it introduced its first major security push in 1999 with its

See Microsoft, page 22

## Putting the squeeze on audio/video

■ BY JASON MESERVE

Broadcast International is looking to redefine the way audio and video is compressed with CodecSys, a new compression method that uses the best qualities of multiple coder/decoders to shrink the size of multimedia files, reducing storage requirement and delivery bandwidth while maintaining quality.

Codecs such as those from Microsoft (Windows Media) and RealNetworks handle every frame or scene of video with the same compression algorithm. CodecSys analyzes each frame/scene to determine which codec is best suited to compress it. Three consecutive frames of video might use three different compression techniques. Instead of the corporate training video being all MPEG-2, it might consist of five different codecs. Audio can be handled in a similar fashion with different codecs handling voice and music.

Broadcast International says its compression is 10 times better than that of MPEG-2, the standard used in DVDs and television. This translates to a 2-hour full-screen movie being stored on a 256M-byte memory stick rather a 5G-byte DVD disc, Rod Tiede, president and CEO of Broadcast International, says. He also says CodecSys can deliver high-definition television at 4M byte/sec instead of the 19.2M byte/sec used in

**PROFILE:**  
**BROADCAST INTERNATIONAL**

**Location:** Salt Lake City

**Founded:** 1984

**Management:** Rod Tiede, president and CEO; Ken Moore, executive vice president and CTO.

**Product:** CodecSys

**Product type:** An audio/video compression algorithm that uses multiple codecs to compress a single file.

**Employees:** 55

**Fast fact:** Broadcast International served up the unaccredited media center in Park City, Utah, for the 2002 Winter Olympics.

today's broadcasts.

"Whatever approach you use to deal with digital images, there will always be some trade-off," says Adi Kishore, media and entertainment analyst at The Yankee Group. "By using this approach, they have the best of many worlds."

Broadcast International uses a proprietary software player to decode and display content encoded with CodecSys, but plans to develop it into a plug-in for a mainstream media client such as Windows

Media Player so potential users do not have to install and learn yet another application. Tiede also says the company is working on getting the CodecSys decoder embedded into a digital signal processing chip for use in cable boxes, satellite receivers and cell phones where processing power is at a premium.

At next month's National Association of Broadcasters show, Broadcast International is scheduled to demonstrate CodecSys in a \$3,000 set-top videoconferencing appliance called Interactive Video. Tiede says the device, which runs on Linux and is H.323 compatible, can deliver full-screen TV video at 100K bit/sec, about one-third the bandwidth that traditional video endpoints use. The 100K bit/sec works only between two Interactive Video endpoints, not any H.323 device.

Despite its promise, CodecSys will not be an overnight success. "Initially it won't replace anything outright," says Michael Hoch, an independent analyst. "What I would like to see happen is compression becoming much more under the covers with something like CodecSys, so that when you go to a customer you're not selling them on MPEG-1, MPEG-2 or Windows Media, you just sell them on your video system, and the customer gets the best compression available." ■



# Vendors set to advance security plans

Sun, Cisco and IBM ready technologies designed to reduce impact of attacks.

■ BY ELLEN MESSMER

Vendors are pursuing a variety of security initiatives intended to rein in the worst effects of problems such as worm attacks, which sometimes scan at ferocious speeds for vulnerable machines.

Sun recently gave a sneak peek into security features that will go into the next version of Solaris, promising customers a more fault-tolerant system and greater resistance to intrusions when Solaris 10.0 comes out by year-end.

Solaris 10.0 will use a fault-isolation technology called "n1 grid containers" intended to help keep multiple applications running smoothly, says Ravi Iyer, Sun's group manager for software systems security. Each container will work like a mini-operating system for an application process, so that if the application's mini-operating system fails, the entire operating system doesn't go down.

"It's a form of resource isolation," Iyer says, noting that IBM and HP have made use of similar approaches.

IBM Director of Security Chris O'Connor says IBM's mainframe and AIX operating systems have long had "multiple logical partitions, each representing a separate machine." He notes that this not only helps

in maintaining uptime when one partition and its application and operating system fail, but also allows for different security considerations in each partition.

Sun also intends to debut other security strengths in Solaris 10.0, including a cryptography framework that would support a variety of encryption algorithms that could be used with applications for authentication and encryption.

"We want application vendors writing to our cryptography framework," Iyer says. A few years ago Microsoft introduced a Windows-based cryptography framework called Crypto APIs, which also required vendor support in applications.

Sun also will be adding what it calls "process rights management" to Solaris 10.0, a form of security protection already said to be built into Trusted Solaris, the hardened version of its operating system typically used by the U.S. Department of Defense or financial firms to process sensitive data.

Process rights management works by having a set of profiles in the operating system

that limit access to the home directory, specific files or server by certain applications.

"If a process is compromised, such as a Web server by a buffer overflow, the attacker may have access to the system, but it limits the ability to move around," Iyer says.

Meanwhile, Cisco's Network Admission Control (CNAC) program, announced last November, is set to begin its first beta tests this month, says Jeff Platon, Cisco's director of marketing for the product and technology group for security.

CNAC includes the newly developed Cisco Trust Agent, which is made up of a few

hundred lines of code that resides on desktops and servers. With the agent, those devices can cordon off infected machines through interaction with Cisco routers and Access Control Server. The Trust Agent — which eventually will be integrated into Cisco's Security Agent behavior-blocking software — is designed to interact with anti-virus software from Network Associates, Symantec and Trend Micro to enforce virus-signature updates. The Trust Agent also will

check on the need for software patches.

Cisco has faced criticism that CNAC is too proprietary, and in response, the company is promising that the basic design specifications will be offered as a public standard. "All intellectual property [associated with CNAC] will be brought to a standards community, such as IEEE or IETF," Platon says.

IBM, which this month announced it has joined the CNAC effort, strongly supports making CNAC-developed technologies more widely available. "We try to validate a concept with a trusted set of partners but we support pushing that work out into the open standards community for broader adoption," IBM's O'Connor says.

IBM, which intends to integrate the CNAC network quarantine technology into IBM Tivoli products, also is working on a new line of security-compliance software products "that will check the operating system and server health," O'Connor says.

While IBM is expected to formally unveil this product line this spring, O'Connor's preview indicates that the IBM compliance line will be able to inspect the operating system or application for a range of vulnerabilities or security-policy checks to indicate remediation requirements or a good bill of health. ■



Cisco's Jeff Platon says the vendor's security package is becoming less proprietary and will be offered of the standards community.

ENZIE PHOTOGRAPHERS

## NETWORK WORLD TECHNOLOGY TOUR BACKSTAGE WITH MARK GIBBS



Network World launches its newest Technology Tour, "Messaging and spam: From chaos to control," later this month. Keynoting the tour is Network World Columnist Mark Gibbs. Network World Events Editor Sandra Gittlen recently spoke with Gibbs about the dire effect spam and other issues are having on electronic messaging.

**The state of electronic messaging is in disarray thanks to spam, liability issues and loss in productivity. What do you see as the breaking point for electronic messaging?**

The breaking point for general electronic messaging between corporations and the rest of the world would occur when spam reaches the 'magic threshold.' This is the point at which the value of SMTP messaging becomes so low that it has no effective business relevance. But this will depend on how good we get at filtering spam out.

Abandoning e-mail will not be an option. For power users who are customer-facing there won't be a choice — in many businesses the value of communicating with customers through e-mail is so significant that there is no way to conceive of stopping.

On the other hand, where the power user is communicating with external business partners, both corporate and personal whitelists will become a powerful tool to

control the volume of spam.

**There are many companies that claim to solve the spam problem. Can the spam problem ever be completely solved?**

The spam problem can never be completely solved because there will always be a gray area where one man's meat is another man's spam. A reasonable target for spam detection should be 99% — the goal is to contain the scale of spam.

**Do you see the face of electronic messaging changing drastically? Will we someday be communicating over a system that looks nothing like the one we have today? Or will we continue to make modifications to today's e-mail architecture?**

I would put cold, hard cash on the future's messaging systems being based on an evolutionary path that is based on today's standards — we have too much infrastructure that supports and relies on SMTP, POP3 and [Internet Message Access Protocol] to dispose of. This means that the only viable alternative is to morph these standards into architectures that are progressively more mature in how they deal with spam and at the same time allow for backward compatibility.

**Where does instant messaging and similar types of communication fit into the picture? Already we're hearing about spam IM or 'spim.' Seems like one more headache for IT departments to deal with.**

Every advance in digital communications gives rise to new headaches (and for that matter, migraines). Instant messaging is no different. IM's role is as a counterpoint to store-and-forward messaging — it

provides real-time connection and presence but demands more attention than e-mail. I see IM becoming as much of a standard as e-mail and the two systems becoming closely related in normal business communication. Spim is a consequence of the openness of IM systems, but given IM's relative youth it is likely that the problem will be addressed before it becomes out of control as spam has become.

**What are five things network managers can do to get their electronic messaging houses in order? How can they start to re-evaluate their systems?**

First, network managers need an in-depth understanding of how their organizations communicate and how the organization wants to communicate in the future. Then they need to understand how their current systems function with respect to current and future needs. Third, they need to analyze the impact that spam is having and tie that down to real costs. Fourth, knowing what is wrong they need to understand what solutions exist and how those solutions can be applied to their particular circumstances. Finally, they need to integrate all of the information they gathered in the first four steps, and build an argument that they can take to senior management to get the budget to install solutions.

What the Network World Messaging Tour will help them with is in understanding and articulating their problems and in learning how their problems can be addressed.

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Live Communications  
Server 2003  
Exchange  
Server 2003  
SharePoint™ Portal  
Server 2003

Services

Live Meeting  
Office Online

Solutions

Solution Accelerators

Enabling Technologies:  
Windows Server™ 2003, Windows® SharePoint Services,  
Rights Management Services



'NET  
INSIDERScott  
Bradner

## The Internet as us

ignore some important trends.

The most important development in Internet content might have been the launching of Google News a while back. This Web site, still tagged as being in beta, is full of automatically generated news summaries and links to news stories. It has provided a window on the 'Net at least as important as the basic Google (and other) Web search sites. According to the Web site, Google News continuously scans 4,500 news sources and feeds the results to a program to determine what stories might be of interest. The note at the bottom of the screen reminds the readers: "The selection and placement of stories on this page were determined automatically by a computer program."

This selection process sometimes results in some strange stories being headlined, but seems to always result in stories from all over the world being featured on the main page. The morning I wrote this, there

were 32 main stories, eight from non-U.S. sources and only five from the big news wires such as Reuters and Bloomberg. The rest of the stories were from a collection of big and small U.S. newspapers and TV stations. In addition, each of the main stories had links to hundreds, and in a few cases thousands, of related stories. This is unfiltered news at its best.

Almost as important a development has been getting an understanding of the work of individual Internet users. According to a new report by the Pew Internet and American Life Project, almost half of adult (18 and older) Internet users are Internet publishers of one kind or another (see [www.nwfusion.com](http://www.nwfusion.com), DocFinder: 1026.)

When World Wide Web technology was first developed in the early 1990s, there was a hope that it would permit the average Internet user to also be a content publisher and bypass the filter that regular content

publishers must be by definition. For a while this seemed to be the case, but quickly the focus shifted to big commercial Web sites and the role of the individual began to fade, at least in public perception. The fact that many broadband ISPs started to prohibit customers from running their own Web sites didn't help much. But the Pew study shows that the individual is out there on the 'Net (and thus can be found with Google and Yahoo).

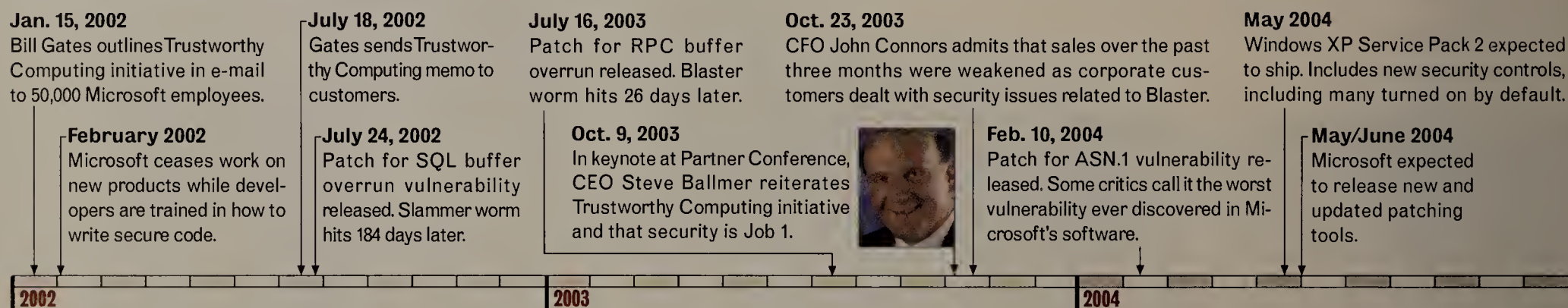
In spite of the worries of many people, and the efforts of some governments, the Internet continues to be an engine for democracy. The Pew report and Google News are examples of what this means.

Disclaimer: Much of Harvard sees itself as an engine for democracy but your mileage might vary. The above is my view.

*Bradner is a consultant with Harvard University's University Information Systems. He can be reached at [sob@sob.com](mailto:sob@sob.com).*

## Security review

Microsoft said two years ago that security would be Job 1. Since then, progress has been made despite several notable vulnerabilities, but critics say more needs to be done.



### Microsoft

continued from page 19

Secure Windows Initiative team. The goal was to provide education, tools, process and testing while not adding more security features.

"It's simplicity vs. complexity, flexibility vs. security," Blum says.

Others say even more drastic measures should be taken by rewriting core code even though it would break compatibility with most existing applications.

"The blind spot is the code base because it is apparent now that Microsoft met ship dates of earlier products by using some sloppy code," says John Kretz, president of Enlightened Point Consulting Group, a systems integrator in Phoenix. "The vulnerabilities can't be addressed with check boxes and default configurations. I would like them to fix the code instead of changing defaults."

It's a drastic measure that points to the problem Microsoft has had

establishing credibility for Trustworthy Computing. Every time progress seems to be made, Microsoft gets shot in the foot.

### Critical weaknesses

Gates sent customers his original Trustworthy Computing memo in 2002, less than a week before the patch was issued for the SQL Server vulnerability that the MSSQL Slammer worm eventually exploited. CEO Steve Ballmer touted the gains of Trustworthy Computing to corporate partners just a week before seven new critical vulnerabilities were revealed. Just after the two-year anniversary of Trustworthy Computing, the ASN.1 vulnerability was made public and Microsoft acknowledged that it had taken more than 200 days to develop the patch for a hole some called the worst ever discovered.

And last month, more embarrassing incidents occurred, including a leak of source code and a fix issued outside of Microsoft's new

monthly patch cycle to correct a bug in Internet Explorer.

It's a list that leaves users cautious.

"I can't say if security has gotten any better," says George Deffenbaugh, manager of global IT infrastructure projects for petroleum company Amerada Hess. "Who knows what's out there that has not been discovered."

Despite the pockmarks, Microsoft points to progress.

Win 2003 needed six critical or important patches in the first 300 days after release, an 83% drop compared with the 36 critical or important patches issued in the first 300 days after the release of Win 2000.

Win 2003 was the first major product that Microsoft developed under its Trustworthy Computing Release Process, an internal process including security design reviews. Office 2003 and Exchange 2003 are some of the 20 products that have been subjected to the same reviews.

### Customers: Tighten up now

"Our No. 1 request from customers is to ship more secure products," says Jeff Jones, senior director of the security and technology business unit at Microsoft. "We think we are on track and doing well in terms of progress."

Jones says success in the short term and long term will be based on writing more secure code, developing protective technologies such as personal firewalls to protect against the spread of malicious code and updating Microsoft's patching technology. "We know we have a lot of work ahead of us," he says.

The company has formed a number of alliances and awareness programs to enlist the help of partners, including the Virus Information Alliance and the Global Infrastructure Alliance for Internet Safety for service providers.

Software also is on tap. Before July, the company plans to ship its Software Update Services 2.0 and Microsoft Update, both tools

for downloading patches, and the Internet Security and Acceleration Server 2004. In the second half of the year, it will ship Service Pack 1 for Win 2003 and more patching tools. And down the road it plans a secure Simple Mail Transfer Protocol gateway, behavior-blocking technology and the Next Generation Secure Computing Base, a combination of hardware and software to lock down the operating system.

TruSecure's Cooper says the upcoming XP service pack, which will turn on by default the personal firewall within the operating system, shows progress not just in technology but also in attitude.

"It's a huge step forward turning something on that will break legacy functionality," Cooper says. "That will create support calls, and it shows Microsoft acknowledges that the security risk is greater than the annoyance and cost of all those support calls." ■



"I want to do whatever is possible to make our professional insurance staff more productive, efficient, and accurate in their work." — **Betty Johnson**

## Betty Johnson Vice President of IT

*The NIA Group of Cos., Santa Cruz, CA*

Betty Johnson is vice president of Information Technology at The Nonprofits Insurance Alliance (NIA) Group of Companies, which provides liability insurance for 501(c)(3) charitable nonprofit organizations in 17 states and Washington, D.C. To her staff, she's an IT hero.

Her challenge: to design a system that fully integrated the Group's claims and underwriting processes. "We needed to streamline our organizational processes and make it easier for our staff to do their jobs," she says.

Her response was NIAC2000, a modular, fully integrated underwriting and claims processing system. This system's capabilities capture both structured and unstructured data, and its intuitive graphical user interface makes NIAC2000 a pleasure to use. Incorporating all lines of the Group's existing business, NIAC2000 also makes it simple to add other modules, such as finance and marketing.

Since deploying NIAC2000 in early 2001, NIA Group has greatly increased its productivity. The result? A 300 percent rise in insurance premium revenues, but only an 85 percent increase in staff.

### Great Moment at Work:

"Seeing the satisfaction of staff. That's who we, IT, work for."

Microsoft Office System salutes those who have done great work in the IT field.

# Great Moments at Work.

Success Stories of an IT Hero





## Lucent Worldwide Services

We make any service provider network more productive.

Computing Sciences Research,  
Lucent Bell Labs

$$x_1, \dots, x_n \mid \lambda_1, \dots, \lambda_n \sim \prod_{i=1}^n \frac{\lambda_i^{x_i} e^{-\lambda_i}}{x_i!}$$
$$\lambda_1, \dots, \lambda_n \mid \alpha_1, \beta_1, \dots, \alpha_n, \beta_n \sim \prod_{i=1}^n \frac{\beta_i^{\alpha_i} \lambda_i^{\alpha_i-1} e^{-\beta_i \lambda_i}}{\Gamma(\alpha_i)}$$
$$\alpha_1, \beta_1, \dots, \alpha_n, \beta_n \sim \dots$$

Product Management—Revenue  
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**INFORMATION  
LIFECYCLE  
MANAGEMENT IS:**

a strategy that uses people, processes and technology to store and tap critical business data throughout its lifespan of value.

**IN THIS EDITION:**

*See how companies are turning their new regulatory challenges into business opportunities by leveraging the benefits of Information Lifecycle Management.*

## Information Lifecycle Management: The Smart Way to Save Money

**CERTAINLY, SMART COMPANIES** recognize that information is the linchpin of their success. In most organizations, corporate information is their most valuable asset, the key ingredient with which innovative new business models are built.

"The ability to use and leverage information as a company to drive additional business is critical," says Mark Lewis, chief technology officer at EMC in Hopkinton, Mass. "For many companies, smart use of information has truly become a differentiator, particularly as technology provides companywide access."

But if innovative information management is the ultimate goal, then the immovable object squarely in its path

is the reality of today's lean IT budgets. Technology is the vital framework on which companies rely to help business information flow freely, but many worthy efforts have been hamstrung by the flat or declining budgets of the past several years.

Yet limited resources are no excuse for limited action, says Chuck Hollis, vice president of platforms marketing at EMC. "More and more companies are realizing that information is money, and they have to do a better job of managing their money," he says. "But all this is happening as IT budgets are flat and labor costs are growing."

Spurred by boardroom-level concerns about the escalating costs of



OPERATIONAL  
EFFICIENCY

**"Our business was able to cut support staffing by 30 percent, yet increase its throughput by 20 percent. [ILM] had a significant bottom line impact and a net delta of somewhere around 10 percent in our profitability, directly attributable to this planned technology."**

—Bob Terdeman,  
Rogers Medical  
Intelligence

technology, IT executives have embarked on a constant search to make their infrastructure as streamlined and cost-efficient as possible.

Many have already implemented measures that address cost-cutting on a piecemeal basis—server consolidation or outsourcing, for example—but also need a method of reducing infrastructure and information management costs enterprise-wide. One intriguing answer: Information Lifecycle Management (ILM), which offers an opportunity to streamline infrastructure costs across the board by tying the business value of information to the cost of managing it.

"If you think of information bits as assets, Information Lifecycle Management is the alignment between the value of information and how much a company is spending to make it available to people," says Hollis.

Information Lifecycle Management can help streamline operational costs. New York's Rogers Medical Intelligence Solutions has recognized significant cost savings through Information Lifecycle Management, according to Robert Terdeman, the company's vice president and chief information architect. "One of the key results is that our business was able to cut support staffing by 30 percent yet increase its throughput by 20 percent," says Terdeman. "It had a significant bottom line impact and a net delta of somewhere around 10 percent in our profitability, directly attributable to this planned technology."

**TECHNOLOGY OPERATIONAL  
EFFICIENCY: BUSINESS DRIVERS**

Much has changed over the past several years for companies that rely on online information for strategic value. Consider:

**Budget Constraints.** While CIO magazine's latest quarterly Tech Poll forecasts a modest increase in IT budgets for 2004, caution is still the watchword. Nearly one-third of survey respondents say that ongoing financial constraints affect IT spending, while nearly 60 percent say that spending

**OPERATIONAL EFFICIENCY:  
BUSINESS DRIVERS**

- Budget Constraints
- Explosive Information Growth
- Manual Processes
- Fragmented Management Strategies
- Regulatory Compliance Issues

on computer hardware will remain flat or decrease.

**Explosive Information Growth.** Companies are squirreling away unprecedented quantities of data in many forms—the structured information that lies in databases as well as the unstructured, file-based information that lies in Word and Excel documents across a network.

"Information is growing at a ridiculous rate," says Steve Kenniston, a technology analyst at Enterprise Storage Group, a research company based in Milford, Mass. "Where there used to be one storage administrator for one terabyte of data, now they need one administrator to manage six terabytes, and soon it'll be one for every 14 terabytes. For that to happen, companies need to make information management more efficient."

**Manual Processes.** "Categorizing, moving and disposition of data is still a very manual process at most companies," says Hollis. "Tools are few and fragmented, and a far cry from the automated determination of policy." Worse, manual information management consumes staff time—and as Hollis points out, "Labor is the most expensive component of IT today."

**Fragmented Management Strategies.** Gaining a bird's-eye view of all that information is no small task. Without a comprehensive strategy, it's difficult for companies to manage the data that's spread across an entire enterprise.

**Regulatory Compliance Issues.** New regulations and corporate governance mandates for the storage and management of information mean that companies must



be able to retrieve data quickly and on demand. Faced with the difficult and time-consuming task of accessing data that may well be spread across a variety of sources—or that may have been deleted—it's small wonder that companies can be frightened into taking a "save it all" approach.

These issues are prompting CIOs to recognize that the real opportunity to drive big costs out of IT is to look across the entire lifecycle of the information and the infrastructures that support it. In short, Information Lifecycle Management.

As detailed in earlier parts of this series, Information Lifecycle Management is not a product but rather a method of harnessing informational chaos. "[It] is a strategy, and one that encompasses people, processes and technology," says Kenniston. Done right, ILM is proactive and dynamic, and

#### INFORMATION LIFECYCLE MANAGEMENT ENABLES OPERATIONAL EFFICIENCY

- Improve Classification
- Leverage Existing Assets
- Enable Policy Automation
- Tier Storage
- Decrease Compliance Costs
- Stretch IT Resources

helps companies plan IT growth to meet their anticipated business needs. "[Information Lifecycle Management] is the ability to provide companies with access to information—the right information—and the most up-to-date and logical version across the enterprise," says Tanuja Randery, vice president for global strategic initiatives at EMC. "If companies want to access and use information to their business advantage, ILM enables this by providing a unified approach to viewing and access while ensuring that the cost and performance of the infrastructure is optimized."

#### LINKING INFORMATION LIFECYCLE MANAGEMENT AND OPERATIONAL EFFICIENCY

Implementing Information Lifecycle Management can help companies manage information both more wisely and less expensively. By building an information management strategy based on this discipline, companies can build cost savings into their infrastructure in a holistic fashion. Information Lifecycle Management Helps:

- **Improve Classification.** Many companies don't even know what they have for equipment. Information Lifecycle Management, which starts with a thorough inventory of physical and informational assets, ensures that companies know exactly what they have, which helps them make better-informed spending decisions. By conducting a data classification and prioritization study, companies can ensure that data is placed on the level of storage most appropriate to its business value. Many times, that means calling in outside experts. "Information Lifecycle Management consultants are part of the storage companies' bench teams," says Pete Gerr, an analyst at Enterprise Storage Group. "They have the services and tools that will help an organization classify and value their data, taking a step toward having a fully realized strategy."
- **Leverage Existing Assets.** Once companies know exactly what's there, they can better prioritize information assets in accordance with information management policies. "If you know up front what you have and how much data is being created, you'll do better capacity planning," says Kenniston.
- **Enable Policy Automation.** The ability to simplify and automate technical infrastructure through Information Lifecycle Management means that companies can lower business costs and hire fewer people. "You get efficiencies by automating the things that people have to do today," Hollis explains. By creating and then automating policies

**"Information is growing at a ridiculous rate. Where there used to be one storage administrator for one terabyte of data, now they need one administrator to manage six terabytes, and soon it'll be one for every 14 terabytes. For that to happen, companies need to make information management more efficient."**

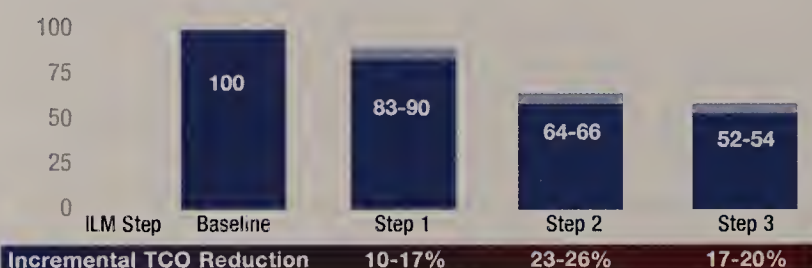
—Steve Kenniston,  
Enterprise  
Storage Group



OPERATIONAL  
EFFICIENCY

## IMPACT OF ILM AND TCO SAVINGS ACROSS STAGES

Three-Year TCO Estimate for Typical Large Enterprise\* (Indexed to 100)

Drivers of Reduction  
with step implementation

\*Enterprise has 750 TB of baseline total storage; TCO calculation includes business costs (i.e., data loss, compliance, downtime, and data search time)

- Networked storage
- Storage automation
- Storage consolidation
- Application-specific service level alignment (based on business policies)
- Improved continuity and compliance
- Automated management and control
- Service levels aligned across enterprise data

SOURCE: EMC

to drive information management, companies can streamline operations and cut costs. "The principal savings is around the dynamic movement of data," says EMC's Lewis. "The value of data changes over time, and ILM helps flexibly move data to the appropriate level of storage as its business value changes."

- **Tier Storage.** Classifying data enables IS executives to create tiered storage that matches the business value of the data with the corresponding price/performance layer of storage. For example, mission-critical applications might reside on high-performance disks, while important but less critical data land on less costly ATA disks. "Having high-end, mid-tier and archive storage makes a lot of sense financially and from a recoverability standpoint," says Kenniston. "By migrating the lower class of information to a second tier of storage, companies save money but also keep it available and protect it more easily." As the range of options in tiered storage increases, so do the effective business continuity options for the corporate world.
- **Decrease Compliance Costs.** Information Lifecycle Management handles data according to its business value at a very granular level, so CIOs know what data should be kept and what can be deleted,

thus saving money. It also makes compliance much simpler, so companies are less likely to incur compliance-related expenses such as legal fees or staffing costs.

- **Stretch IT Resources.** Automating information management in accordance with data policies means that CIOs will be able to redeploy existing staffers to other projects, making their resources go further for the same money. "If companies can automate the process and take the human aspect out of it, it saves them money," says Kenniston. "Once CIOs are convinced that storage can be automatically moved to the right asset when they want to move it, automation is the next step."

In an era of increasing concern over the cost of technology, CIOs see the wisdom of embracing budget reduction strategies that add value as well as cut costs. One important step is to implement a strategy that works across the entire company to manage information holistically.

"By implementing Information Lifecycle Management, we believe that CIOs can expect to see a net of up to 50 percent actual cost savings in overall storage costs," says EMC's Lewis. Companies can make sure that they drive all possible extra costs out of managing and storing information—and at the same time, truly give business leaders what they need to thrive.

"If you recognize that information is a core company asset similar to physical plant and human resources, then you really understand the value of an integrated storage solution," says Terdeman. "Because what you're really storing are critical company assets in a managed and efficient way."

**NEXT:** In the next part of this series, we'll look at Information Lifecycle Management for small to medium-sized enterprises (SMEs).

**EMC<sup>2</sup> FOR MORE INFORMATION**  
where information lives Visit [www.emc.com/ilm](http://www.emc.com/ilm)  
for an in-depth look at Information Lifecycle Management products, services and strategies.

QUESTIONS ABOUT  
INFORMATION  
LIFECYCLE  
MANAGEMENT?

If you've got any burning questions about Information Lifecycle Management—and how you can begin implementing such a strategy—send them to [ilm\\_questions@emc.com](mailto:ilm_questions@emc.com). We'll answer the most frequently asked questions later in this series.



# Service Providers

■ THE INTERNET ■ EXTRANETS ■ INTEREXCHANGES AND LOCAL CARRIERS  
■ WIRELESS ■ REGULATORY AFFAIRS ■ CARRIER INFRASTRUCTURE DEVELOPMENTS

## Short Takes

■ Last year proved productive for **DSL service providers** as 2.7 million new users signed up for the broadband service — up almost 30% over 2002 — according to a new report by the DSL Forum. The report, which was put together by consulting firm Point Topic, says there were 9.1 million DSL subscribers in the U.S. at the end of 2003. The U.S. has the third largest number of subscribers after China with 10.9 million and Japan with 10.3 million. The total number of DSL subscribers around the world totals 53.6 million. The DSL Forum predicts that number to jump to 200 million by year-end 2005.

■ **AT&T** last week signed a deal with **New York Community Bank** worth \$8.6 million. AT&T is deploying Internet access, data and voice services to all 139 bank branches throughout New York state. AT&T also is providing local voice service to 50 bank branches. New York Community Bank is consolidating its communications services onto one contract, AT&T says. The service provider also says that the financial institution will save \$2 million over the next four years.

■ Users in Indiana, Kentucky and Ohio will have a new **broadband** option this month in the first large-scale rollout of broadband over power-line service. **Current Communications**, a BPL vendor, announced last week it is teaming with Cinergy Broadband to roll out BPL service in Cinergy's coverage area by March 15. Current has been conducting small-scale trials of BPL in Cincinnati and Potomac, Md., for more than a year. The rollout follows an action by the FCC last month to move forward with a process to measure interference caused by BPL service. The move drew criticism from groups such as the American Radio Relay League, which contends that BPL interferes with ham radio signals. The service will cost \$30 to \$40 per month depending on the bandwidth speed.

## Q & A Dunn discusses comeback of Nortel



*After free falling for three years, Nortel has stabilized, and landed some big deals, including a VoIP coup with Verizon. CEO Frank Dunn recently discussed the state of his company and the industry with Network World Editor-in-Chief John Dix, Managing Editor of The Edge Jim Duffy and Senior Editor Phil Hochmuth.*

### What's the business climate look like in terms of capital spending?

Our assessment is the [capital expense] spending profile in 2004 vs. 2003 will be up in the low single digits. Within that, enterprise [spending] will be a little more robust than service provider. There will be huge growth in certain segments, and quite a contraction in other sections. You're going to see a big growth in spending

on 3G wireless, and you're going to see the market shrink for GSM.

In the enterprise, people are going to spend on convergence, spend to drive costs out of the network, and spend on things like business continuity, storage-area networking, and driving capability back into the network.

### What about in terms of wireless vs. wireline spending?

When you look at the carrier businesses it's been on the wireless side. And there is going to be a continued migration and a demand for mobility. No one wants to be tethered to a phone. But you [also] will see spending in wireline, because they have to adjust to a data services business model, and to do that you're going to have to transform the network; not a rip and replace, but a transformation of the network. They need to be able to offer multimedia services, and to do that you have to spend a bit of money. Verizon, Bell Canada, MCI and Sprint — they're all moving in that direction.

See Dunn, page 26

## MCI offers DoS safety net

Carrier guarantees response to reported attacks with SLA.

■ BY DENISE PAPPALARDO

MCI last week announced its first service-level agreement that covers response time for denial-of-service attacks directed at its customers.

The carrier guarantees its security team will respond to DoS attacks directed at any of its IP customers within 15 minutes of when a user calls MCI and the carrier issues a trouble ticket.

The guarantee covers "how quickly we get our experienced security team engaged with the customer working toward stopping the attack and mitigate [the attack's] impact on their business," says Bob Blakely, senior product manager for security services at MCI.

If MCI's security team does not respond within 15 minutes, the customer is issued a one-day service credit. That translates to a \$20 credit for a customer that pays \$600 per month for a dedicated T-1 line that supports its Internet access traffic. There is also a maximum of one credit per day.

The guarantee is available immediately at no additional charge to all MCI IP cus-

tomers, including its dedicated Internet access, IP VPN, Internet Colocation and Web hosting service users.

Although MCI is promising it will respond within 15 minutes, the carrier says it's typically much quicker than that. MCI responds to all DoS attacks "in about 5 minutes and much of the time much faster," says Chris Murrow, network security engineer at the carrier.

Within those first minutes MCI's security team typically "blackholes" the DoS attack traffic. In other words, it redirects the traffic away from the user's site. Then MCI activates another set of tools that lets the carrier essentially find out where the rogue traffic is coming from and thwart the attack.

MCI has used the same practices and security tools for several months, Blakely says. What's new is that the carrier now is trying to offer customers peace of mind that any DoS attack will be dealt with swiftly.

The SLA specifically covers DoS attacks that customers bring to the carrier's attention. MCI, like its main competitors AT&T

and Sprint, does not offer a proactive DoS service to customers, although all are promising to develop them.

Proactive DoS tools automatically notify the carrier that there has been a drastic change in traffic heading toward a specific customer, which is a telltale sign of an attack. Carriers would not have to depend on customer notification. Proactive tools pattern changes coming from servers on their network that could be acting as zombies that blindly send out massive amounts of traffic to specific Web sites that are under attack.

All three interexchange carriers say they will have proactive tools available to customers by year-end, but none would provide detailed information.

MCI is the only carrier offering customers an SLA that covers DoS response time, although the guarantee could offer more bite. The clock starts when a user calls MCI and the carrier issues a trouble ticket. The SLA would be more compelling if it wasn't dependent on user notification and if there was a stronger credit behind non-compliance on MCI's part. ■



## EYE ON THE CARRIERS

Johna Till Johnson



## AT&amp;T: Not your mother's Ma Bell

consistently scored lower than competitors MCI and Sprint.

So what's up? Can AT&T survive?

The answer might surprise you: Absolutely. Under the radar screen, the company has managed to re-invent itself as a lean, mean fighting machine that clearly understands its mission as a service provider in the post-bubble economy. Behind the scenes, AT&T has been quietly streamlining processes, massively upgrading technology and paying down debt to ensure it will succeed in the long haul. Yes, it faces a long uphill battle to prove itself once more to skeptical customers. But from all evidence, it's prepared to take on the task.

Think I'm nuts? Some background:

- AT&T has some of the tightest operational performance numbers in the industry. Revenue per employee — a critical measure of a company's operational effectiveness — is between \$500,000 and

\$600,000, which positions AT&T well ahead of every one of its traditional competitors, and more than 30% better than the next in line, MCI. How did the company do it? See the last item on world-class technology.

- Surprisingly, AT&T has a lower debt-to-earnings ratio than fresh-out-of-bankruptcy MCI. Over the past few years, AT&T has quietly reduced its debt from nearly \$60 billion in 2000 to a mere \$8.8 billion in 2003 — bringing its debt-to-earnings ratio well below that of MCI's, and well ahead of the rest of the industry's.

- The AT&T Wireless sale is far from being a road post on the death march to oblivion. The move actually ranks as one of the most strategically brilliant deals in telecom history. In one fell swoop, AT&T divests itself of an aging network with creaky technology, reclaims its damaged brand, fattens up its cash reserves, and ensures that its two most threatening rivals no longer have the resources to launch

takeover bids. (A little-noted facet of the deal is that it virtually exhausts the cash reserves of BellSouth and SBC, which jointly own Cingular.)

Through it all, AT&T has intelligently invested in world-class technology. It's quietly decommissioning 4ESS switches and turning up IP telephony services. Internally, the company's investment in Web services technology has enabled improved productivity with reduced overall costs.

This all means that AT&T has fundamentally restructured itself to be more responsive, more technically agile, and more efficient than it's ever been before. It will take time for these changes to filter out to the customer experience. But keep watching, you might be surprised.

*Johnson is president and chief research officer at Nemertes Research, an independent technology research firm. She can be reached at johna@nemertes.com.*

## Dunn

continued from page 25

**Speaking of Verizon, how is the carrier handling the evolution to a full, softswitch architecture? Do they have a timeline in place?**

Our solution in the enterprise space and the carrier space is you go at your own pace. So that's why there is no big bang. You don't kind of build a packet network. You start implementing. Verizon has a different timing strategy than Sprint and MCI, than Hong Kong Broadband, and China NetCom. We work with each of them. The pace will be predicated on the success.

**What's holding optical back? Why is the market not growing any faster than it is?**

What's holding it back is the access. As people are connecting to DSL they're starting to use the Internet more often, they're starting to drive traffic. When you start getting wireless data, when everybody is sending pictures and videos around, it's going to chew up bandwidth.

Secondly, in the backhaul network there was so much bandwidth put in. We have enough for a while. So we just have to wait out this lull, and I expect it to start to turn around. Maybe not in the next six months, but it's coming.

**Is the convergence push that you're seeing with the carriers going to drive convergence in the enterprise?**

No. The strategy will be that we offer a [Multimedia Communications Server] product to an enterprise. So if you happen to have a PBX, we could put this multimedia communication service capability on top of that, and call it 5100. If we go to 5200, the carrier will offer it as a hosted service. The service set could be exactly the same.

**The multiservice edge is a red-hot market now. What are you doing to address this market?**

We're integrating [Multi-protocol Label Switching] onto our ATM [platform]. That same platform will be able to be migrated to MPLS. Then you're saying, 'But Frank, how are you going to take the multiple boxes at the edge and simplify it, right?' The answer I'd give you is that it is a very high priority [at] Nortel.

What we did on (the Optical Multi-service Edge product) we collapsed three or four boxes into one, on a very scalable, flexible, capable product. So then you go into Layer 3 and Layer 7, and there are multiple boxes and we have to do what we did with OME at the Layer 2 and Layers 3 to 7. So we understand it, and that's something that we're focused on.

**Regarding the broadband access partnerships you announced recently: Is that your strategy to address that market or do you plan to re-engage yourself internally in broadband access?**



**“When you look at the carrier businesses it's been on the wireless side. And there is going to be a continued migration and a demand for mobility. No one wants to be tethered to a phone.”**

Frank Dunn  
CEO, Nortel

We need to be able to deliver capability without owning everything. Is it important to offer that capability now? Yes, we need to find a partner. The biggest issue is where are these inflection points? We've got to hit those inflection points. But to say let's sit out of the market for two years and then hit the inflection point, our view is you lose

a lot by not being in the market, not learning from your customers, not learning the challenges. So we'll be in the markets, that's part of that game, but the longer game is we're going to simplify all of this stuff. And as everything collapses into simpler, more integrated platforms and so on, we're going to be a player in that. ■

## Court tosses telecom rules back to FCC

■ BY GRANT GROSS

WASHINGTON, D.C. — An appeals court has thrown out a large chunk of the FCC rules governing what parts of their networks the incumbent local exchange carriers must share with competitors.

In a ruling released last week, the U.S. Court of Appeals for the District of Columbia Circuit overturned much of the so-called Triennial Review Order that the FCC approved in February 2003 and released in final form in August. The decision directs the FCC to rewrite the rules for how ILECs must share parts of their networks with competitors such as AT&T and Sprint, collectively called competitive local exchange carriers (CLEC).

The decision is a setback for the CLECs

and state public utilities commissions, which had power under the FCC plan to set some of the network-sharing rules. The ILECs, which had joined the U.S. Telecom Association (USTA) in the lawsuit, expect to benefit from the court's decision. Incumbent carriers had criticized the FCC's decision to leave some rule-making up to the states, arguing that forcing them to comply with 50 separate sets of rules would cause uncertainty in the industry.


The appeals court decision, the third court ruling overturning FCC telecom rules since 1996, doesn't affect the FCC's decision to let the four ILECs stop sharing most of their broadband networks, including DSL infrastructure and new fiber rollouts, with competitors. But the ruling overturned the FCC's decision on sharing switching facili-

ties and some high-capacity DS-1 and DS-3 network loops. The court ruled that the FCC did not comply with the 1996 Telecommunications Act when it left some decisions affecting the sharing of unbundled network elements to states instead of providing federal guidelines.

The USTA and the incumbent carriers cheered the court decision. "The court action is a victory for consumers and should help this industry move forward in developing healthy, sustainable and economically rational competition that will extend telecommunications innovations farther and faster in the marketplace," said William Daley, president of SBC.

*Gross is a correspondent with the IDG News Service's Washington, D.C., bureau.*





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# Special Focus

**PORTABILITY:** Opportunities and pitfalls.

## Porting wireless numbers could pay dividends

■ BY DENISE PAPPALARDO

If you're interested in significantly reducing your company's wireless service expenses, it might be time to go shopping with your wireless phone numbers.

St. Joseph Regional Medical Center in Patterson, N.J., says it cut its monthly wireless service bill in half by porting all its phone numbers from AT&T Wireless to Cingular Wireless.

"We were with AT&T Wireless for over five years," says Kate Wray, systems coordinator at the medical facility. "We saw an opportunity to look for better cost savings, and Cingular gave us the best deal."

Wireless number portability is the reason for the savings. The government mandated that wireless service providers let customers port their phone numbers to other carriers in the top 100 cities in the U.S. as of Nov. 24. The carriers are required to support porting in the rest of the country by May.

It was imperative that Wray's 40 users kept their current phone numbers, which made shopping around for a better price impossible in the past, she says. It was especially important for St. Joseph's social workers and those who work with its community outreach programs to keep the same numbers so patients and clients could stay in touch.

So when wireless number portability went into effect, Wray didn't waste time. She filed her porting request in the first week of December. She shopped around with several carriers and chose Cingular because of the total cost of the deal. When porting to a new carrier, customers almost always need to buy new handsets that are compatible with the new carrier's network. Cingular bundled free phones with lower service rates and won St. Joseph's contract.

Despite predictions of wholesale defections, droves of customers have not been knocking down the doors of wireless service providers to take advantage of portability. Customer churn numbers were not up substantially in the fourth quarter (see graphic). But carriers that had customer service issues, especially AT&T Wireless, did lose a significant percentage of customers last quarter.

"For the most part, Nextel, Sprint [PCS] and Verizon [Wireless] do a very solid job," says Randy De Lorenzo, vice president and general manager of wireless services at Telewares, a consulting firm that negotiates telecom contracts for large companies. "Most of the carriers now have dedicated project managers who work with users on cutovers. These porting requests have to be taken as seriously from a project-planning sense as a full landline cutover."

Now that carriers have had a chance to work out system glitches,

more businesses are examining their options.

"We are seeing nearly every enterprise leverage [wireless number portability] in contract negotiations," De Lorenzo says. Where the majority of users were looking at porting some of their business to new carriers, some are becoming more aggressive. "We're seeing our first 10,000-phone cutover go live," he says.

The competition wireless portability has created is new to carriers, De Lorenzo says. Even customers that are happy with their current service providers should shop around and maybe even move some of their phone numbers to another carrier as a bargaining tool, experts agree.

"In almost all cases, carriers are absolutely trying to keep users," he says. "We had three engagements in the last four months where carrier CEOs got involved in the deal to try to keep the customer. It's very competitive."

### Watch 'hidden costs'

While all users might not cut their wireless service expenses in half, as St. Joseph's did, Gartner estimates that a company with 1,000 wireless users could reduce its annual service costs by more than \$200,000. But Gartner also points to "hidden" costs that users might not initially think about.

St. Joseph's opted for Cingular's free phones for its users, but this option might not fit the bill for all companies. Some require phones with features such as voice dialing, push-to-talk or text-messaging support. These are typically features that are not included in free phones that carriers offer new customers.

Gartner estimates that a company with 1,000 users could pay as much as \$235,000 for new phones and another \$15,000 to train employees on how to use the new service and their phones most effectively.

While De Lorenzo says he thinks Gartner's estimates are on the high side, the fact is that phones that support push-to-talk, for instance, can cost \$200 each. But he recommends users focus on the overall deal and not individual handset costs. "A well-negotiated agreement looks at the total cost," he says.

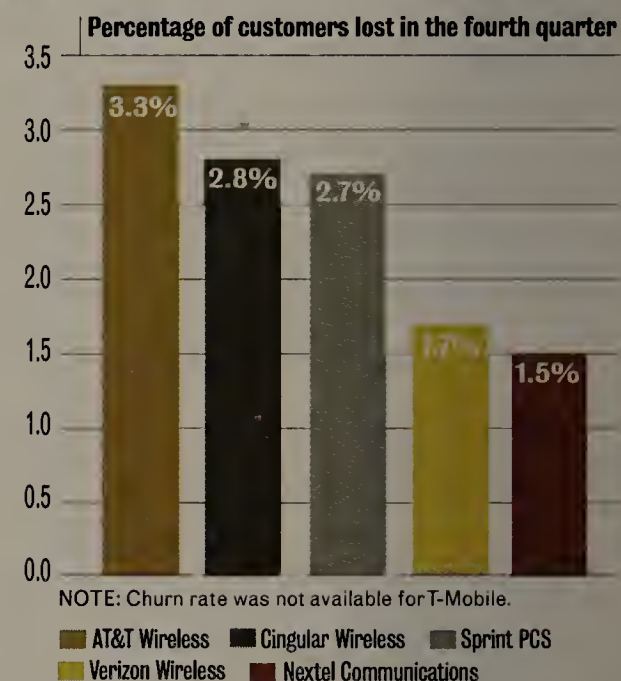
For example, customers should lay out exactly what they need in terms of handset features and geographic reach. Experts say that ensuring your new carrier has solid service in all the markets that your users frequent is just as important as price. A lower monthly bill will not make a difference if users regularly lose calls or can't get service.

Nothing is mature after three months, and wireless number portability is no different. The system is not without problems.

From the time St. Joseph put in its porting request to AT&T

### As the wireless world churns

**AT&T Wireless, which acknowledged having problems implementing wireless number portability in the fourth quarter, suffered the highest customer churn rate among leading**



Wireless, it took two and a half weeks for the carrier to release its numbers, Wray says. "Once the numbers were released, 95% of them went over to Cingular in one afternoon," she says.

The remaining phones trickled in through the rest of the week, she says. Not knowing when the numbers would cut over was difficult from a handset management perspective. She is still waiting for AT&T to explain why it took so long to release the numbers.

"It would have been nice to have been notified that the cutover was happening so we could notify our users," Wray says. "That could have gone better."

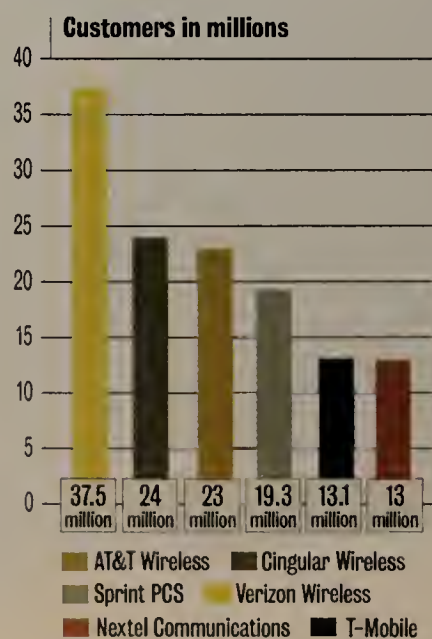
Other than the wait and lack of clarity on when the cutover would happen, Wray says overall her porting experience was positive — especially when she considers the company's cost savings.

To ensure a smooth transition, some analysts recommend users stipulate certain guarantees in the service-level agreement (SLA) of their new contract that covers porting. Gartner says the SLAs should cover how long the porting process should take, how accurate the porting will be and penalties if the carrier does not meet the guarantees.

Gartner says users should demand daily progress reports from both carriers to make sure each upholds its end of the bargain. ■

### Sizing up the carriers

**While Verizon Wireless had the most customers at year-end 2003, the pending merger of AT&T Wireless and Cingular should result in the biggest customer base this year.**



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# Technology update

■ AN INSIDE LOOK AT THE TECHNOLOGIES AND STANDARDS SHAPING YOUR NETWORK

## XMPP transports presence data

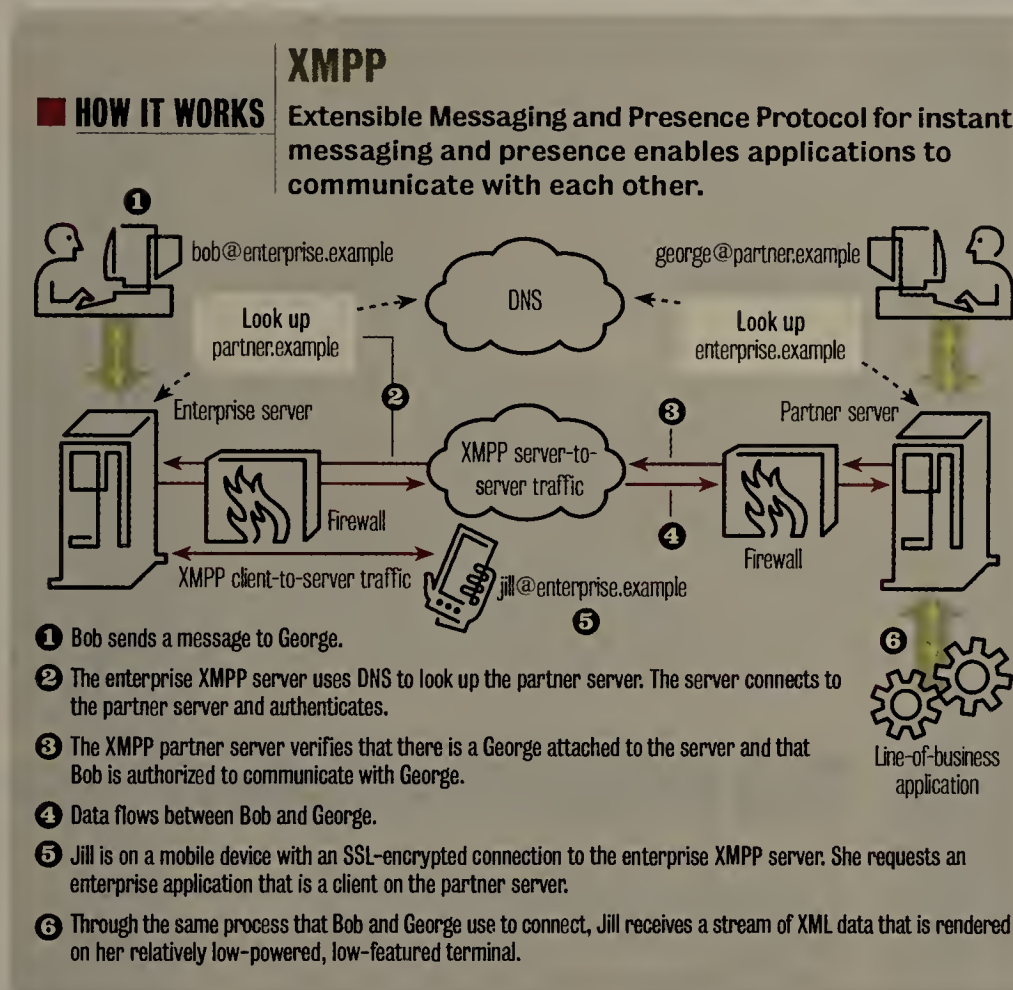
■ BY JOE HILDEBRAND

Businesses increasingly require real-time interaction among people, applications and devices that span many networks. Extensible Messaging and Presence Protocol offers a way to route context-sensitive data among a complex interconnection of nodes.

XMPP is an XML streaming protocol for presence and messaging routing. Recently ratified as an IETF standard, XMPP serves as the basis for the Jabber instant-messaging system and provides a secure but easily programmed language for linking diverse networks.

The core of XMPP routing is an internationalized logical addressing scheme that is best represented as node@domain/resource. In the Jabber IM system this scheme is referred to as the Jabber ID (JID). The domain portion can be looked up in the DNS, similarly to an e-mail address. As in Simple Mail Transfer Protocol, servers (the domain portion of an SMTP address) connect with one another on behalf of users (the node portion of an SMTP address). In XMPP, the node portion can denote an IM user, an application or a service. The resource portion is a connection identifier that lets a single user be logged on multiple times simultaneously.

When nodes connect to a server, they authenticate using credentials from the local directory system, specify a resource and tell to the server to announce their presence to subscribers (for example, the buddies on one user's roster). Servers find, connect and authenticate to one another, letting any node connected to the community talk to any other node regardless



of their home server (domain), as long as no privacy or business rules are violated.

Each XMPP stanza is a chunk of XML structured data that is addressed to a JID. Each stanza type can be extended with any properly name-spaced XML structured data. The Jabber Software Foundation (JSF) acts as a standards body for these extensions, much like the World Wide Web Consortium standardizes Web formats. But any organization or set of trading partners also can decide on de-

facto formats as needed.

XMPP serves as a universal transport layer for XML structured data. It embeds presence and context sensitivity into that data, which lets the data be routed efficiently to the most appropriate resource.

The protocol is layered in such a way that it allows maximum simplicity of implementation for clients. For example, one of the extensions the JSF provided is a specification for gateways to other IM systems. A client can use XMPP to talk to any

IM vendor's system for which such a gateway exists. This simplicity of implementation has fostered a large open source community and many interoperable commercial implementations of XMPP.

While IM interoperability is a hot topic, another useful benefit of XMPP is enabling real-time communication of presence information across applications.

For instance, a CRM or other enterprise application can appear as a client to an XMPP server. At the discretion of the administrator, other entities can know the presence and availability of that application to receive and process specific data. Using the XMPP network as the common transport mechanism, an application residing in one organization can — within the confines of the governing business rules and logic — efficiently communicate with an application or person residing outside that organization.

One example is a CRM application using XMPP to dynamically move data to the most appropriate and best available resource. This might be a customer approval form sent to a cell phone, or the data associated with an escalating trouble ticket moved from front-line support to an available support resource in real-time.

XMPP already has thousands of deployments. The standard has gained significant market traction because it is inherently open and clear. Native XML design also provides developers and architects with more options to build the interfaces, business rules and logic that will let their legacy and emerging applications communicate with each other.

*Hildebrand is chief architect at Jabber. He can be reached at [jhildebrand@jabber.com](mailto:jhildebrand@jabber.com).*

## Ask Dr. Internet

By Steve Blass

**As most machines on the Internet have a unique IP address, why can't we avoid media access control and use IP addressing all the way to the destination machine?**

Because LAN hardware relies on data link layer communications for data delivery to destination machine. Frames transmitted across a physical network must contain the hardware address of the destination. The IEEE 802 protocols for shared

multi-access LANs divide the data link layer into a Logical Link Control layer that provides a way to address a station on a LAN, and a MAC layer that provides the interface to network media and frames data for transmission over the network. TCP/IP sits on top of the LLC layer. IP addresses are virtual addresses in software that provide a network interface for applications to communicate across physical network implementations. There are no Internet protocols at the data link

and physical layer. Internet protocols were designed for underlying network technology (see [www.ietf.org/rfc](http://www.ietf.org/rfc)). TCP/IP provides the layer of abstraction for internetworking across physical network boundaries, but IP relies on the physical network to deliver data to destination machines.

*Blass is a network architect at Change@Work in Houston. He can be reached at [dr.internet@changeatwork.com](mailto:dr.internet@changeatwork.com).*



# GEARHEAD INSIDE THE NETWORK MACHINE

Mark  
Gibbs



**W**elcome to week four of Cascading Style Sheets. Last week we began a descent into the depths of Dynamic HTML, a quasi-standard that lets scripting languages modify HTML content (which includes CSS) to make Web content dynamic. We started in on the architecture that defines the content of a browser window: the document object model.

But we didn't mention the relationship of XML to DHTML. You treat an XML tag like an HTML tag, although to be rendered the browser must support XML and the XML content must be declared (let us know if you'd like us to look at this topic).

We concluded last week threatening to discuss document object model (DOM) standards, so here goes: In books and online you will find references to the Netscape Layer DOM, the Microsoft IE All DOM and the World Wide Web Consortium's (W3C) ID DOM.

These were all versions of DOMs that are now effectively obsolete unless you need

to support older browsers.

Today, the working DOM for browsers is the W3C's DOM. Here's the W3C DOM Working Group's description of the specification: "This document contains the requirements for the DOM, a platform- and language-neutral interface that allows programs and scripts to dynamically access and update the content, structure and style of documents. The DOM provides a standard set of objects for representing HTML and XML documents, a standard model of how these objects can be combined and a standard interface for accessing and manipulating them. Vendors can support the DOM as an interface to their proprietary data structures and APIs, and content authors can write to the standard DOM interfaces rather than product-specific APIs, thus increasing interoperability on the Web" (see [www.nwfusion.com](http://www.nwfusion.com), DocFinder: 1027).

## Dissecting DOM

The DOM specification contains several layers: Level 1 is the core for HTML and XML document models, with functionality for document navigation and manipulation. Level 2 includes a style sheet object model, defines functionality for manipulating style information attached to a docu-

ment, enables traversal of the elements of a document, defines an event model and provides support for XML namespaces. Level 3 (which is not yet finished — see DocFinder: 1028 for details) will specify document loading and saving; content models with document validation support; address document views; and formatting, key events and event groups.

The DOM Level 1 and Level 2 specifications are final, so developers can implement them without fear of the specifications changing.

Using the DOM you can create, read and modify elements in the structure of a document loaded in a browser window using a scripting language embedded in the document. We'll consider JavaScript, although you could use other scripting languages such as VBScript and Perl.

But if that is all there was to the DOM, there wouldn't be much dynamism involved. Nope, the DOM also includes event handlers that are triggered when certain things happen to or in a document or an element in a document.

There are many types of events, including object events (onLoad), element events (onFocus), and mouse events (onMouseOver, onMouseOut). For a complete list and an in-depth description, see DocFinder:

1029; and for a simpler description of the events that apply to HTML 4.0, see DocFinder: 1030. As a simple example, consider the following code that would be in the body of a document:

```

```

The event handlers in this code reference the object `document.images.strangedevice`, which is the identity of the image tag the event handlers are embedded in. The image tag initially displays the contents of the file `flagdown.jpg`, but when the mouse is moved over the image the event `onMouseOver` is triggered, causing another image named `flagup.jpg` to load. When the event `onMouseOut` is triggered, the original image, `flagdown.jpg`, is reloaded.

The image object could be referred to as `images.strangedevice` (the root object, document, is implicit), or just `strangedevice` because it is a unique ID in the document (although that could lead to errors).

Next week, a more complex and generic version of the image rollover above.

Your code to [gearhead@gibbs.com](mailto:gearhead@gibbs.com).



# Cool Tools

Quick takes  
on high-tech toys  
By Keith Shaw

# The latest in trackers, players and more

**Product:** GeoSentry PT-100

**Company:** GeoSentry — ([www.geosentry.biz](http://www.geosentry.biz))

**Price:** \$1,000 for the unit; \$100 per month for service.

**What it does:** While conventional wireless and GPSs are not new, the GeoSentry PT-100 goes further. The unit is self-contained — batteries, antennas and electronics are encased in the device. GeoSentry offers its SureTrak 4-in-1 system, which offers cell phone tower estimation when the reception is blocked from GPS; enhanced sensitivity to GPS; a beacon transmitter for precise asset location and recovery; and an audio buzzer that offers another way to locate the unit. Once deployed, locating the device is done through a GeoSentry Web site, tracking through mapping software.

**Why it's cool:** The Web site is easy to use for tracking PT-100 devices, and the unit is easy to turn on, recharge and associate with the satellite. If you need to track items, whether they are trucks, packages or other things, this an easy-to-use system.

**Grade:** ★★★★★

**Product:** Auvi SA100-64

**Company:** Auvi Technologies

**Price:** \$50

**What it does:** This audio player connects via USB to a PC for file transfer. It runs on one triple-A battery and is the size of a stick of gum, making it perfect for using while exercising and other activities.



**The no-frills Auvi SA 100-64 is great for workouts.**

**Why it's cool:** Sometimes we love the basics — there are no frills on this device, such as a display or fancy file support. If you own a larger, hard-drive-style MP3 player (such as an iPod), you already have what you need to create music files. This then becomes an accessory to that player. The SA100-64 is a great tool for workouts. At \$50 it's also good for users looking for basic features.

**Grade:** ★★★★★

**Product:** DocuPen portable scanner

**Company:** Planon System Solutions

**Price:** \$200

**What it does:** This portable scanner lets you scan articles, and letters by dragging the pen down the length of the document. It scans at 100 or 200 dpi, and then transfers to a PC via serial or USB cable. If you have paper documents you want to store in electronic format, using the DocuPen is an easy way to scan them in.

**Why it's cool:** There's a cool James Bond feeling when we use the scanner, as if we've broken into some secret headquarters to find the plans of the enemy. More importantly, the scanner's portability makes it great for road warriors who need to send documents electronically and don't have the space to lug around a larger scanner.

**Grade:** ★★★★★

Shaw can be reached at [kshaw@nww.com](mailto:kshaw@nww.com).

Here are some testing nuggets from the Cool Tools labs:

**Product name:** Psion Teklogix NetBook Pro

**Company:** Psion Teklogix

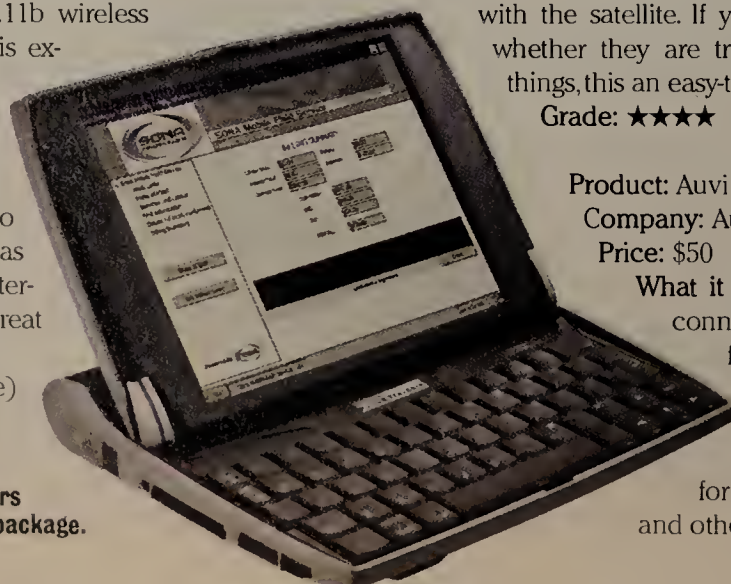
**Price:** \$1,500

**What it does:** A cross between a PDA and a notebook computer, the NetBook Pro gives users word processing ability, Web surfing and other Microsoft application-viewing capabilities. The system is based on Windows CE and can connect to a PC for synchronizing contact data and file transfers. The device's expansion slots (including a Secure Digital/MultiMedia Card, Compact Flash and PC Card slot) allow for extra memory or communications ability (such as a 56K bit/sec modem or 802.11b wireless LAN card). The NetBook Pro is extremely small, with a tiny keyboard and a touch screen with a stylus for mouse functions.

**Why it's cool:** For users who need basic applications such as word processing, e-mail and Internet browsing, the NetBook is a great alternative to a heavier laptop.

**Grade:** ★★★★★ (out of five)

Psion Teklogix's NetBook Pro offers users basic functions in a small package.





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## EDITORIAL

John Dix

## How the bad guys view software

**T**he recent RSA Security conference might have seemed like an odd venue to announce a book called *Exploiting Software: How to Break Code*, but the intention isn't what it seems. The authors hope that showing why software is vulnerable and how people try to take advantage of it will result in more secure systems.

The author of the foreword, Aviel Rubin, technical director of the Information Security Institute at Johns Hopkins University, puts it this way: The authors "have done a marvelous job of explaining why software is exploitable, of demonstrating how exploits work and of educating the reader on how to avoid writing exploitable code."

For co-author Gary McGraw, this is the latest in a string of books about information security: Earlier works include *Securing Java* and *Building Secure Software*. In fact, McGraw sees *Exploiting Software* as a natural complement to *Building Secure Software*, which he wrote in 2001.

"*Building Secure Software* got the ball rolling on software security," McGraw says. "The problem is, on the application side there are a lot of vendors concentrating on the right problem — they understand software is a security problem — but they are taking an outside-in approach, saying if we just do some black-box testing or protect this broken software with an application firewall we'll be OK. That doesn't take into account the true nature of the software exploit, so that's why Greg Hoglund and I decided to write *Exploiting Software*, to make the discourse about the real problem clearer."

In the book McGraw says "software defects are the single most critical weakness in computer systems" and "bad software is ubiquitous."

Asked if network defenses, then, are merely chewing gum stuck in the cracks of a sinking ship, McGraw says: "The fact is, network security mechanisms are necessary but not sufficient. We keep trying to protect our broken stuff from exploit by building a perimeter defense around it. The notion of defending the edges is not bad, it just doesn't work all the time. Especially when it comes to complex software that is Internet-based, highly distributed and designed to be extensible. As software gets more important and more complicated, the chances of us solving our problem with edge-level network mechanisms is zero. We have to make software more secure from the get-go." (See a full interview with McGraw at [www.nwfusion.com](http://www.nwfusion.com). DocFinder: 1033.)

The book gives a good inside look at where you might be most vulnerable and goes in-depth into several subjects, including buffer-overflow problems.

— John Dix  
Editor in chief  
[jdix@nww.com](mailto:jdix@nww.com)

### Charging for e-mail

Regarding Mark Gibbs' Backspin column "The charge is in the e-mail" ([www.nwfusion.com](http://www.nwfusion.com), DocFinder: 1022): I agree e-mail postage is a silly idea, but not for the reasons Gibbs cites. People wouldn't leave the 'Net in droves; they would simply use a different method to send one another messages.

It would take, oh, 15 minutes after the postage scheme was announced for peer-to-peer servers to appear that would route messages to destination addresses and maybe hold them for people to call for them. It wouldn't take much for I-got-it messages to be sent back to the sender. The system would look rather like, er, e-mail. It just wouldn't use the metered e-mail servers.

Bill Meakin  
Alameda, Calif.

Mark Gibbs and Bill Gates are all wet. Charging for e-mail is the only way spam is going to come under control, because you make it advantageous for anyone with a significant volume of received mail to collect from those who sent it, with charges maybe being forwarded through those who relay mail.

Charge .01 cent per e-mail, for instance. Charge another .01 cent per megabyte in an e-mail. For the average consumer, that's going to be much less than a dollar per month. The ISP can round it into the monthly charge and only item-bill its spam originators, if it has any left, after the first month.

But for the spammer, it's going to cost some genuine bucks (something like \$100 per million, if my math is right). Still less expensive than snail mail, but no longer free. It won't end spam, but it'll force the spammers to start targeting their recipients.

The billing infrastructure can be written in Perl in less than a day. It probably can be a one-liner. Have a

E-mail letters to [jdix@nww.com](mailto:jdix@nww.com) or send them to John Dix, editor in chief, Network World, 118 Turnpike Road, Southborough, MA 01772. Please include phone number and address for verification.

contest. How hard can it be? Every mail server in existence has mail logs.

You don't need a government agency involved, just a little old-fashioned greed. Say as ISP A you're entitled to collect \$500 in net received e-mails from ISP B (a spammer). If ISP B doesn't pay up, you just quit accepting mail from it. Other ISPs treat you the same way. Those that originate huge volumes pay those who receive those volumes. The average consumers pay nothing and get nothing, except maybe a lower volume of spam in their mailboxes. Enforcement isn't necessary, we just have to get the first few large ISPs to start. It'll spread like wildfire.

Do I have all the details worked out? No. Do I think it's worth a try? Yes. Does anyone have a better idea? I haven't heard it.

David Neill  
Oklahoma City, Okla.

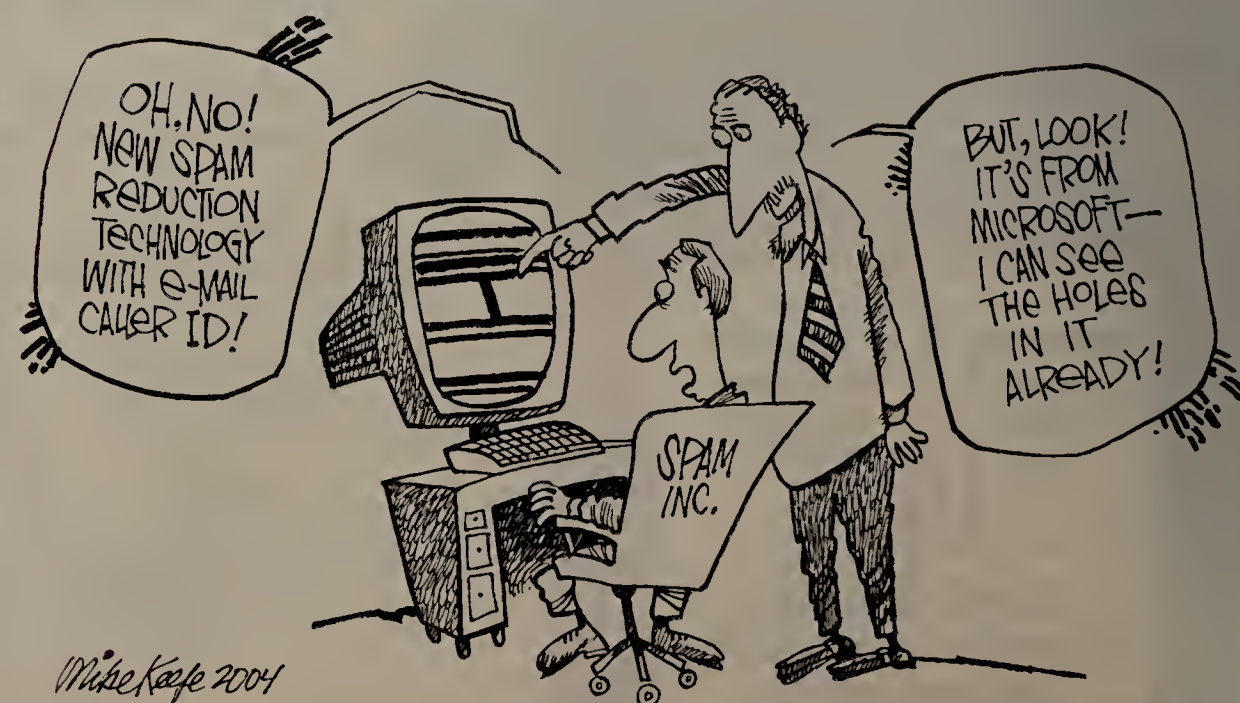
In his column "The charge is in the e-mail," Mark Gibbs writes: "In [Bill] Gates' scheme, the message recipient would get to set a price to be paid by the sender if the recipient rejects a message as unwanted. Of course there's no product yet to back up this vision."

I have been using a similar product since January 2003, and Gates/Microsoft had nothing to do with it. It's called Vanquish and it lets e-mail come to me at my discretion. Since January 2003, more than 39,000 spams have been deflected from my in-box. Unknown senders can get into my in-box in one of two ways: verify they are who they say they are (in which case, I am given a confirmed sender address) or purchase a bond from Vanquish. A portion of that bond becomes default if that company sends something to me that I determine to be spam.

Byron Todd  
Consultant  
Todd Computer Solutions  
Rainbow City, Ala.



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## INTRANET ADVISOR

Daniel Blum

**O**ffshore outsourcing might be a good economic decision for some organizations based on lower labor costs. But make sure you carefully consider the security risks of the decision.

Regulations such as the Health Insurance Portability and Accountability Act, Gramm-Leach-Bliley Act and California's SB 1386 require companies to protect privacy and impose stiff financial or disclosure penalties if they do not. Such regulations apply equally to data owners and outsourcers within the U.S., but not necessarily to outsourcers in China or India, which are relatively regulatory-free jurisdictions. Investigate these IT-related regulatory issues with your legal department.

Other risks come from giving outsourced staff access to IT systems within your network. I recently met with a financial services company that gives outsourcers VPN access to development systems for system maintenance, coding and testing.

Although the company had provided network access to vendors before, offshoring cast the practice in a new light: Low-paid, relatively high-skilled unknown workers would be coming right into the soft center of the intranet.

The first line of protection is to set up user authentication and firewall rules that constrain which IP addresses each remote user can access. This method increases management complexity, but the real problem is that firewall rules only lock down the first hop; once a user has access to an internal host, he might gain access to other hosts through telnet, Windows Terminal Server, Internet Explorer,

# Weigh risks of offshore outsourcing

rlogin, rsh or many other facilities. Outsourced programmers also easily can "root" development machines, install Trojan horses, corrupt production databases and cause other problems.

There are no fully satisfactory mitigation strategies for a second line of defense. You can try to use Web access rather than VPN access, but not all applications can be Webified. Hosts can be hardened, but it's difficult to contain a savvy power user with access to a machine. Development hosts can be zoned off into a private area, but that still leaves all the hosts vulnerable to any one outsourcer. An intrusion-detection system can scan for improper traffic, but IDSs are notoriously expensive and hard to get right.

The irony is that all these countermeasures — several of which might be required — directly contradict the original outsourcing objective to cut costs. In the long run, companies might find it more expensive to outsource than to leave work in-house. How will your company do sufficient background checks on all the offshore outsource's employees? Do you plan to conduct audits of completed code to ensure no back doors have been planted for future access?

Make sure you're ready with architecture plans, cost estimates and risk assessments before that outsourcing request lands on your desk. There are a number of forums where colleagues in your industry might be studying the minimum required practices for offshore outsourcing. Attend one — and get ready.

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**The irony is that all these countermeasures . . . directly contradict the original outsourcing objective to cut costs.**



## TELECOM CATALYST

Daniel Briere

**E**very time I see a government official or someone on CNBC talk about improving U.S. productivity, I immediately think of the obvious solution — find a way to stop spam, and you'll see productivity increase tremendously.

I'm not advocating a governmental or legislative answer; what we need is a technology breakthrough. But what we're getting are quick fixes that might create more problems than they solve. What I'm specifically against are the easy, blanket answers to which many large providers resort because they can't move fast enough to really deal with the problem in a more technically advanced way.

Take Time Warner's Road Runner service. I've had problems with Road Runner blocking various domains associated with some of my clients. Road Runner says it uses outside lists to manage its spam attacks and even offers up whitelists it accesses to find legitimate e-mailers. However, Road Runner also will block ranges of IP addresses from ISPs that have allowed spam to come from any server in their subscriber base. That definition of "spammer" pretty much covers every ISP in the U.S.

My company uses two ISPs, InterNap and Media3, and both have the same problem with Road Runner: They are regularly being classified as spam sources, and they have to undertake about a two-week process to get the specific IP addresses of non-spamming clients cleared up. And in that time frame, no e-mails from any of the IP addresses in their IP ranges can get through to Road Runner subscribers.

Right now, we're having to work through just this issue with Road Runner to get e-mail turned back on so we send e-mail on the Road Runner system. So despite its claim to a high level of sophistication, Roadrunner takes the "throw the baby out with the bathwater" approach by cutting off the ISP and the IP range altogether. This Road Runner problem hits us every two or three months, and each time it takes two weeks to resolve. The most irritating part about all this is that

# Quick fix is no fix for spam

Road Runner does not notify the sender that it is deleting the inbound e-mails; it just sends an admin-class e-mail to the originating server, so you never know your e-mails are not arriving.

The same problem exists with network-based virus protection, something we all agree we need. My cable modem provider, Charter Communications, responded to the Blaster virus last summer by turning off User Datagram Protocol (UDP) on the network. Sure, this stopped the Blaster virus from spreading on its network, because the Blaster virus used UDP to find other potential hosts across the network. But in Charter's infinite wisdom to protect me from the viruses, the company also disabled my Trend Micro virus-protection software's ability to update itself over the network. So I found myself cut off from Internet resources with no notification and no clue why.

At some point, such an approach crosses the line from being a valid response to a problem to interfering with business. It's one thing to cut off the ability to send out blasts of e-mail, but another to stop all other e-mail. The same is true with turning off protocols to deal with viruses.

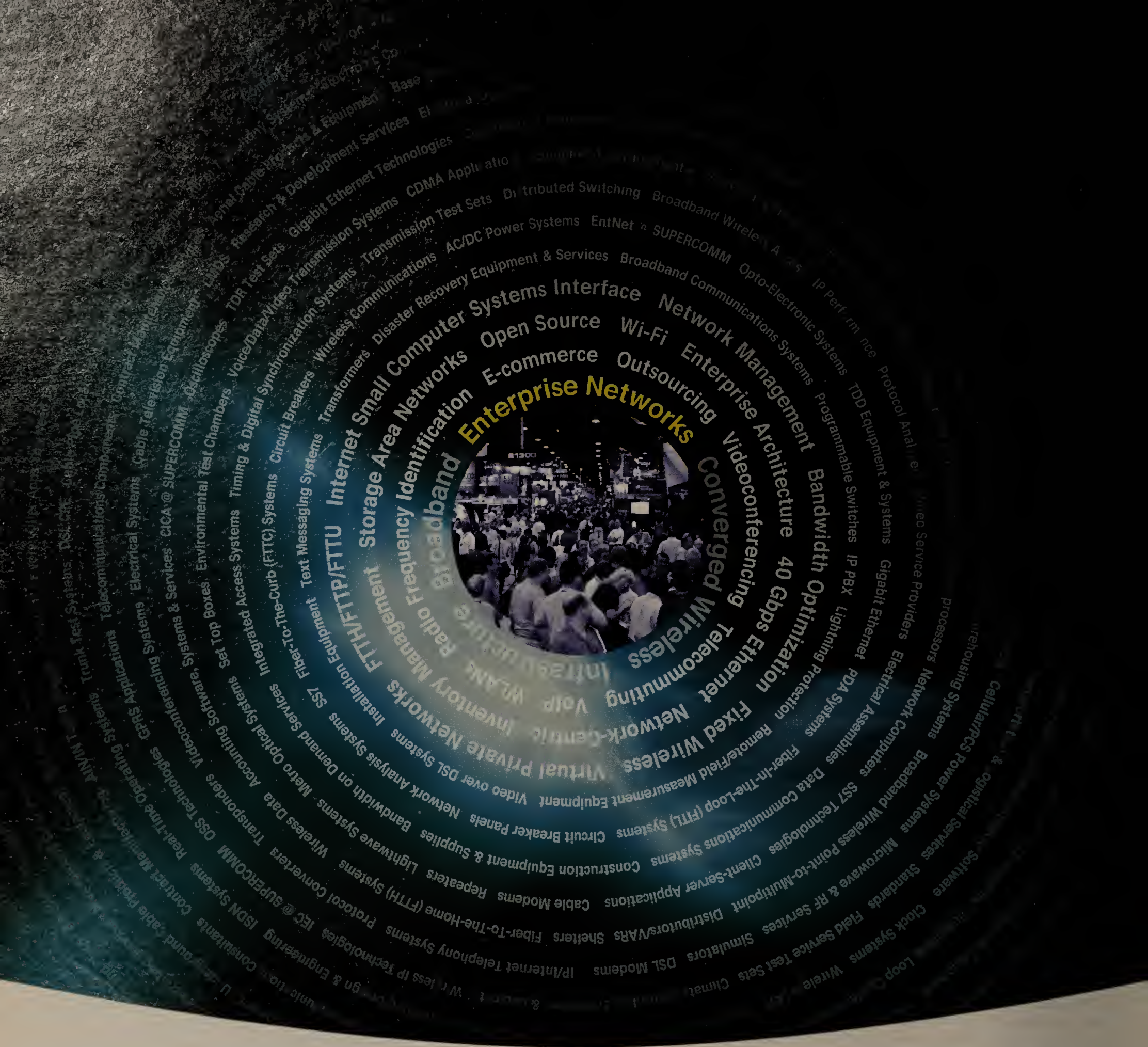
Such actions substantially affect business operations and cause financial damage. Until recently, there's been some degree of tolerance, as people recognize the overwhelming issues involved in dealing with the sheer volume of spam and viruses. But it's time to force those who claim to be protecting us from spam to apply the same principles internally. Yahoo would scream all sorts of things to Washington if AOL decided to cut off all e-mail from Yahoo subscribers on the grounds that one Yahoo server was sending out spam.

This is a class-action lawsuit waiting to happen. ISPs cannot indiscriminately throw away e-mails — e-mail is too important. Those practicing such sweeping solutions need to reassess the impact they are having or be ready to defend against a range of legal action.

*Briere is CEO of TeleChoice, a market strategy consultancy for the telecommunications industry. He can be reached at [telecomcatalyst@telechoice.com](mailto:telecomcatalyst@telechoice.com).*

**It's one thing to cut off the ability to send out blasts of e-mail, but another to stop all other e-mail.**





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# Digging for digital dirt

Continued from page 1

The purpose of the lab is to analyze evidence gathered at crime scenes involving the military. Whatever crimes occur in the civilian world, you also see in the military. It could be homicide, child pornography, identity theft, counterfeiting, misconduct, terrorism, espionage, contractor fraud or misuse of government property.

With these crimes, there's often digital evidence in cell phones, pagers, PDAs, geo-mapping systems, digital cameras, cockpit recording systems and anything else with flash memory or ROM.

"We estimate that 95% of criminals leave digital evidence at the scene," says Donald Flynn, attorney adviser for the Defense Department Cyber Crime Center, which houses the DCFL.

That evidence must be able to stand up in court, particularly now that judges and attorneys are becoming savvy enough to start asking questions about the integrity of digital evidence. The DCFL addresses this through rigorous training and advanced tools such as certified, high-capacity extraction and imaging processes and tools.

## Inside the lab

My tour guide at the high-security lab pushed a button at the double-door entryway into the lab that triggered blue ceiling lights, which blinked incessantly to alert technicians that unclassified visitors were

## DCFL: Case file ▶ The busted boyfriend

A suspect said the gun used in the murder of his girlfriend was stolen earlier that day from his car by someone who smashed his right passenger car window.

A video technician at the Department of Defense lab painstakingly upgraded a grainy image of the suspect's car taken from a military surveillance camera three hours after he claims the window was broken.

Finally, she enhanced the image to provide the damning evidence against the suspect: light refracting off an intact, passenger-side window. The suspect got a 25-year sentence.

on the premises.

The lab includes your standard office cubicles, but every cube is outfitted with state-of-the-art processors, multi-system server stacks and 42-inch flat-screen monitors.

"Some of the evidence comes in on pallets — cases full of servers, CPUs, RAID disk arrays, floppy diskettes, Palm Pilots, digital cameras," says special agent Bob Renko, director of operations for the lab. "We've even gotten evidence in buckets of water — for example, video tapes recovered from jets crashing into the sea during training exercises."

The first stage in evidence extraction is digital imaging. This is trickier than it sounds because contents can be altered in the process — such as adding a date stamp when copying a hard drive, thus tainting the evidence and rendering it inadmissible.

Then there's the sheer volume of data. In 1999, analysts examined their first terabyte-sized case when they received a palette of computers belonging to a defense contractor accused of violating Environmental Protection Agency guidelines in its handling of toxic waste. If analysts had tried to use technology that copied and examined one drive at a

time, they still would be investigating that case, says the lab's director, Lt. Col. Ken Zatyko, special agent with the Air Force Office of Special Investigation.

So analysts created their own script, which moves images of all the media into one place. In this location, searching and extraction is conducted across all the data simultaneously using the same search phrase.

Last month, the lab received several palettes, containing more than 3T bytes of data to image and extract. The evidence, which filled a 20-by-10-foot windowless room, required its own

## Securing the digital crime scene

Whenever corporations suspect legal trouble, they'll need to preserve digital evidence, says Robert Goto, senior technical forensics adviser for Electronic Evidence Discovery in Seattle.

At the very least, network professionals should know who to call if they don't have the legal expertise to manage the investigations themselves. Along with companies specializing in digital evidence recovery such as EED and New Technologies, the Big Four accounting firms also offer forensics services.

But even calling in the experts requires corporations to handle some data. So Goto offers this advice:

- Take custody of the entire computer, including keyboard and other peripherals, floppy diskettes and other removable media so you can show that what you took was a working computer.

- Note unique identifiers, label items taken, seal smaller items in plastic bags and place in a secure area.

- Document who did what throughout the chain of custody for each item collected. Maintain logs of where you are keeping records.

- If the computer is to be recirculated, take the hard drive from the machine and secure it. An original makes the best evidence.

- Then make a forensically sound image of the hard drive, using hardware-based drive imaging tools as opposed to a write-blocking software tool. (Tools can be found at [www.eedinc.com](http://www.eedinc.com) and [www.forensics-intl.com](http://www.forensics-intl.com).) At this time, also note the system date/time before rescuing the hard drive.

- Other data sources, such as network file shares and e-mail located in server-based e-mail systems, must be considered and preserved. Data throughout the network is the most difficult to gather and analyze, so EED has created a discovery tool for this widespread data ([www.eedinc.com/products.aspx?iProductId=2](http://www.eedinc.com/products.aspx?iProductId=2)).

— Deborah Radcliff



Members of the Defense Computer Forensics Lab collect digital evidence at a crime scene.



## Wanted: A few good forensics investigators

The Defense Computer Forensics Lab's caseload has grown each year. In 2000, the DCFL investigated 148 crime and intrusion cases. In 2003, that number was 425. Lt. Col. Ken Zatyko, special agent with the Air Force Office of Special Investigation, expects more than 500 cases in 2004. With 115 employees, the DCFL has a 20% vacancy rate.

The DCFL is what military people call a "purple agency," meaning it's staffed by enlisted people from all branches from the military, along with non-military personnel. For non-military employees, salary ranges from \$30,000 to \$110,000 per year, says Bob Renko, director of operations for the DCFL.

Entry-level positions are mostly in digital imaging, which calls for skills and knowledge in forensically accepted techniques and tools for copying data. From there, technicians advance to data extraction and analysis, intrusion analysis and information assurance, and then onto management.

For each level, employees undergo rigorous training, testing and laboratory experience that takes months to complete. Others in the military take the training with them to conduct forensics for their particular branches and units. Courses include:

**Intro to networks and computer hardware:** The basics of operating systems, network devices, connectivity, topology and protocols.

**Basic forensic examinations:** Understanding computer operating systems, forensics workstation setup, and analysis of Web-related evidence, e-mail and deleted file and password recovery.

**Advanced forensic examinations:** Covers Windows, comprehensive Internet analysis, keyword searches and data recovery from encrypted files, metadata and erased files.

**Incident responders course:** Includes first-response evidence collection, network protocol functions, routers and firewalls, network sniffers and intrusion-detection systems.

**Managing computer investigations:** Students learn field seizure methods, forensics procedures, network investigation procedures, managing personnel, legal issues and ongoing personnel training.

— Deborah Radcliff

storage-area network.

The recovery process begins with entry-level technicians checking evidence out of lockup. Then they create bit-stream mirror images onto cleaned hard drives to prevent contamination.

They make the copies using a modified Linux tool dubbed DCFL Data Dump. The tool is akin to private-sector imaging tools such as SafeBack, which takes a mathematical hash of the image and compares it to the original hash to prove the image is an exact replica.

### Crimes and misdemeanors

The busiest unit in the lab is Major Crimes and Safety, which handles criminal cases involving digital media. The forensic analysts in this unit work in open cubicles, each with two Windows 2000 workstations, one to search the imaged data and another to store recovered evidence or for when they're working two cases at once.

Renko says the agency's extraction tools work in a forensically sound manner across computers and PDAs, but become problematic when it comes to cell phones and pagers.

"At least one time, we've had to work directly with the telephone manufacturer to successfully retrieve data," he says.

For computer examinations, the agency's standard data search and extraction suite of tools is called iLook, which is licensed by the Treasury Department. A private-sector equivalent would be EnCase.

Bill (for security reasons, analysts are only allowed to give their first names) is an advanced forensics examiner and former metropolitan detective in Washington, D.C. He explains how the tool conducts keyword searches, and reassembles damaged and erased files, e-mails, attachments, temporary Internet files, data files and renamed files into a list of searchable files.

"Say you have a contractor using sub-standard explosive bolts, which are critical to pilot safety because they're what makes the cockpit lid fly off in an emergency ejection. We know the cost of quality bolts should be about \$100. We can do keyword searches through their accounting systems on 'explosive bolts' to see what they're actually paying for them," Bill says. "Or, if we have a child porn case, we can order up a thumbnail view of all Internet cached files across multiple drives to see what's been downloaded."

As Bill finishes talking, a long list



Technicians gather evidence from a variety of sources, including hard drives, floppies, audio tapes and video tapes.

of files appears in the search window of his workstation. Six suspicious files are highlighted in yellow, indicating that the search phrases were found in those files.

### Hardware magicians

Shortly after it became operational in

drives," Renko says, while pointing out lockers where evidence is stored when not being processing.

He stops in a small room with two Plexiglas-enclosed clean areas where technicians have soldered mutilated floppies and repaired hard drives that have been thrown off balconies and

even shot with AK-47s, as in one recent battlefield case. The data where the bullet holes and solder marks are can't be recovered, but the rest can, Zatyko says.

The intrusion-analysis squad occupies the rear section of the lab, where examiners, who work primarily on Linux systems, investigate hacks on Defense Department networks.

"Our first job is to find out how the

computer was intruded upon and what data was accessed by the intruder," says "Sig," who was recruited from his job as head of information security for a university. "For the information assurance part, we tell our client agencies what

### DCFL: Case file

#### ► The watered-down evidence

If you watch the television series "CSI," you might think forensics work is glamorous. But Melody, a forensics video examiner who used to work for a state crime lab before moving to the DCFL, says it can be highly specialized and very tedious.

Melody works with state-of-the-art video analysis software programs to enhance marginal and damaged video images. She's received melted, crushed and mangled tapes — even tapes in buckets of water (for example, when two aircraft crashed into the sea during a training session).

"If a plane goes down into the water, I request that the training tapes be kept in water until they get to me where I can dry them out properly," she says. "I take the tape out, clean it, dry it and put it back together. The safety board needs me to repair these tapes so they can determine if the cause of crash was a training, equipment or environmental problem."

1998, the lab received a classified hard drive that seemed impossibly damaged. An outside firm estimated it would cost \$250,000 to repair. Renko balked.

"We figured it was more feasible to train our own people to repair hard



their entry point was and what needs to be patched to protect from future hacks."

Sig pulls up an advanced tool named Starlight. A multi-colored, three-dimensional map pops up: Each of its lines represent a separate connection made into the defense network and each color representing a different protocol.

"We've had entire underground hacker ISPs coming at us," Sig explains. Color-coding protocols makes it easier to determine which computer is sending which attack. "For example, the exploit in this case ran over HTTPS, so we color-coded all the HTTP proxy traffic in red. Then we can see that three of these IPs coming at us are involved in that type of traffic," he says.

In this case, the hackers were caught and prosecuted, and the entire hacking group disappeared from the Internet underground, he says.

As examiners trace hackers back to different hops and examine those boxes, they run into new variants of hacker tools stored on those computers that haven't been reported by tracking services such as CERT and Bugtraq.

## DCFL: Case file

### ► The meandering hubby

A man called 911 to report that he came home to find that his wife had been stabbed. But instead of saying, 'Oh my God, someone's tried to kill my wife,' he babbled incoherently on the phone for 15 minutes while his wife was bleeding on the kitchen floor.

"Police thought his reaction wasn't normal, and they wanted to know what was happening during the 911 call because they could hear noises in the background," says Donald Flynn, attorney adviser for the Defense Department's Cyber Crime Center in which the DCFL is housed. Were those noises the sound of the husband attacking his wife? "Our analysis was able to prove the sounds were just him walking around the house bumping into things. Turns out, a neighbor did stab the woman. She later recovered."

The new hacker tools are added to the unit's malicious logic database, which will then detect them if they're used in future cases.

Furthermore, the database helps analysts spot similarities when multiple attacks are hitting different Defense Department networks at the same time, indicative of a large-scale attack by one source. Such cases are then reported to the Joint Task Force on Computer Network Operations.

In recent months, law enforcement agents from Australia, Canada, Germany, Hong Kong, Singapore, the U.K. and other nations have toured the facility to better develop their own cybercrime units. U.S. attorneys, judges and law enforcement agencies also frequently call for technical clarification. (For example, a recent call came in from a judge who needed to

know the difference between evidence recovered from a cached memory vs. evidence found in a file on the hard drive.)

As more cases involve digital evidence, the need for sophisticated digital forensics capability throughout the legal system will continue to grow, says Gail Thackery, U.S. Attorney for the state of

Arizona. Thackery has prosecuted a number of computer-related crime cases and teaches at ACIS International Association of Computer Investigative Specialists.

"Police used to worry about guns and blood and chemical evidence, but now every case in America has a computer involved in it. The legal system is hungry for

experts at digital evidence," she says.

"So computer forensics training and careers are going to be hot for a long time," she adds.

*Radcliff is a freelance writer in California. She can be reached at deb@radcliff.com.*



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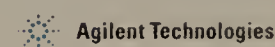
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# CLEAR CHOICE

## TEST

### Dell's PowerConnect 6024

## Dell hits the price/performance mark with new Gigabit Ethernet switch

■ BY JOHN BASS, NETWORK WORLD LAB ALLIANCE

**W**ith the outstanding performance numbers and extensive feature set offered by its new PowerConnect 6024 Layer 3 switch, it's getting easier to hear the words "Dell" and "Gigabit Ethernet switch" in the same sentence.

The 24-port PowerConnect 6024 switch hit the streets last month and is targeted for data center server connectivity, wiring closet aggregation and as a core switch for smaller networks or branch offices. It features serious routing protocol support, physical redundancy, quality of service (QoS) and access control lists (ACL), all for about \$3,500. Our only complaint is that it lacks a high-bandwidth stacking backplane that would improve its overall bandwidth scalability.

The switch comprises a 19-inch box with all 24 10/100/1000 ports positioned on the front of the unit. For administrative access, it has a serial port, but it also offers a 10/100M bit/sec Ethernet port as an optional console port. This alternate interface is much faster than the serial port for issuing command-line instructions and means you don't have to dedicate another Gigabit port if a separate administrative network is mandated for security purposes.

The PowerConnect 6024 offers a typical bundle of Layer 2 features including 802.1Q virtual LAN (VLAN) support, 802.1ad link aggregation support, and

standard and Rapid Spanning Tree capabilities. At Layer 3, the switch supports Routing Information Protocol (RIP), Open Shortest Path First (OSPF) and Virtual Redundant Routing Protocol (VRRP) specs. QoS is implemented with eight egress queues that can be configured with strict priority or Weighted Round Robin (WRR) queue servicing algorithms.

Both Layer 2 and Layer 3 throughput tests showed near wire-speed performance (See How we did it at [www.nwfusion.com](http://www.nwfusion.com), DocFinder: 1023). The switch hit 99.3% maximum throughput. At 7 microsec for 64-byte packets and 70 microsec for 1,518-byte packets, latency is low enough to support most enterprise applications.

In our test of the routing features, the PowerConnect 6024 handled a maximum of 2,050 RIP routes and 4,095 OSPF routes, very good numbers for a switch of this class. Route convergence for RIP and OSPF was stable and adjusted to large changes in routing information with ease.

The switch can implement ACLs based on Ethernet media access control address, IP address and TCP/User Datagram Protocol (UDP) port number. As many as 1,024 ACLs can be configured within the switch and 1,024 entries can be added to each ACL. We didn't verify the switch's ability to configure 1,024 ACLs with 1,024 entries each — doing so would only test memory constraints. But we did configure a single ACL with 1,024 entries, assign that ACL to each physical interface, and run Layer 3 throughput and latency tests. Under these conditions, the PowerConnect 6024 only reduced its throughput to 97.7% for 64-byte packets. Latency did not change significantly.

In terms of QoS, the PowerConnect 6024 prioritizes packets based on 802.1p priority values or differentiated services code point (DSCP) values. The queue-servicing algorithm can be configured as strict priority, WRR or a combination of both. We tested 802.1p and DSCP queuing features and found that the queuing algorithms operated properly for both strict priority and WRR.



The PowerConnect 6024 has some strong features such as routing protocol support, physical redundancy, quality of service and access control lists.

### Management

Dell offers three management interfaces: a Cisco-like command-line interface (CLI) accessible via the serial port or via Telnet; its own Web-based OpenManage Switch Administrator; and the Dell Network Manager.

The Dell OpenManage Switch Administrator is accessed through a Web browser via the administrative Ethernet port or a configured administrative VLAN. The Web interface was responsive and easy to use. Configuring and viewing large ACL tables was easier using the CLI.

Dell OpenManage Network Manager application — some of which was beta code — was resource-intensive and slow, but gives a lot of functionality if you need to manage multiple PowerConnect switches.

A standard edition of this application can be downloaded for free from Dell's Web site, but the company offers an advanced edition that features configuration wizards to ease the setup of complex features such as QoS — for about \$5,000.

The PowerConnect 6024 has three configuration files: a running configuration file, a start-up configuration file and a back-up configuration file. All configuration changes must be copied to the start-up configuration to be in effect after a reboot. If there are problems at reboot, a back-up configuration can be used to back out of a network change. These configuration files can be moved in and out of the switch through Trivial FTP. The files are in text format and can be manipulated with a text editor outside the switch.

The PowerConnect 6024 can hold two software image files. While we only had one image to work with, assuming this feature works, backing out of botched software upgrades should be fairly easy.

The reboot time for the switch is 45 seconds, which should not greatly affect network operations.

The PowerConnect 6024 includes two built-in, redundant load-balancing power supplies and two redundant system fans. The power supplies and system fans are hot-swappable.

It also has link aggregation features (802.1ad) with the ability to configure a maximum of seven groups with seven links per group. To offer redundant routing features, the PowerConnect 6024 has VRRP functionality. We couldn't test 802.1ad and VRRP capabilities with only one switch.

The PowerConnect 6024 doesn't have a stackable backplane to give a cluster of switches the ability to scale its bandwidth. Given the abundance of enterprise-class switch features in the PowerConnect 6024, it appears that high-speed stackability should be the next frontier for the Dell switch product line.

Overall, considering the PowerConnect 6024's performance, feature set and management capabilities, this new Dell switch should be capable of supporting typical enterprise-class applications.

*Bass is a senior technical staff member at North Carolina State University's Centennial Networking Labs in Raleigh, N.C. He can be reached at [john\\_bass@ncsu.edu](mailto:john_bass@ncsu.edu). Chintan Desai and Reza Manavi of CNL assisted with the testing.*

### Net Results

#### PowerConnect 6024

**Company:** Dell, (800) 999-3355, [www.dell.com](http://www.dell.com) **Cost:** \$3,500. **Pros:** Great Layer 2 and Layer 3 feature sets; excellent management capabilities; nearly perfect performance. **Con:** No stacking features.

#### The breakdown

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## Management

# Strategies

- CAREER DEVELOPMENT
- PROJECT MANAGEMENT
- BUSINESS JUSTIFICATION

## Training on a shoestring budget

IT executives share smart suggestions for boosting IT skills without breaking the bank.

■ BY LINDA LEUNG

Your training budget probably took a hit in the IT spending squeeze, but you're still charged with providing a solid IT infrastructure to ensure your company stays competitive. To do this, your staff needs to learn how to innovate with existing or new technologies.

### Standardize your IT infrastructure and training.

When SBC and BellSouth joined forces to form Atlanta-based Cingular in 2000, the company began standardizing on technologies, such as databases, which has helped refine its training needs. The company also has defined courses, such as project management, that are applicable to staff across all business units. Instead of each unit developing its own project management courses, for example, training needs are pulled together and courses are developed so that all departments can share the results.

### Look for in-house superstars.

Who else are experts at your processes, infrastructures and developments other than your in-house staff? At lighting manufacturer Osram Sylvania of Danvers, Mass., in-house instructors present much of its training. IT staffers are responsible for training power users on SAP. The users in turn train their respective teams. Osram's human resources executives also provide internal training to IT folks on professional development and leadership management.

"The use of internal instructors/subject matter experts makes sense because who knows how we use SAP better than our employees?" says Ellen Famigliette, IT training manager at Osram. "Most enterprise application deployments are customized and therefore need customized training that is only applicable to that company. In addition, our HR trainers understand the hierarchy of employees at Osram."

### Ask your big brother for help.

Ever thought about how you could roll out new services in your organization without spending a dime buying all the necessary equipment and technologies? IT staffers at the Career Center of the University of California at Los Angeles can learn about and work with advanced technologies such as storage-area networks, Gigabit Ethernet and Active Directory, without the center paying to install such applications or buying specific courseware.

Despite budgetary constraints in the state of California, Abel Stephen, the center's IT manager, successfully negotiated for the larger Office of Technology Center (OTC), which offers basic networking services to UCLA's student affairs division, to provide the career center with the advanced technologies listed above. This initiative, dubbed Leveraged Outsourcing of Infrastructure Support (LOIS), helps the OTC argue for the maintenance of its budget level by demonstrating that it has taken on wider responsibilities.

The career center IT staffers benefit because they can work with and learn from their OTC colleagues about the use of those hot technologies. "My staff are rewarded by allowing them to play a prominent role in project-managing each implementation phase [of LOIS]," Stephen says. "Before, my staff was viewed as 'tech support.' Now they will have the opportunity to transition to project managers."

### Negotiate free or reduced-cost training from your vendors.

"Every vendor wants their product to be successful, and so you should ask them to help you be successful," says Greg Snooks, director of IT hardware and software development at Cingular. He says companies of any size could reduce their training costs by a minimum of 20% by pressing vendors for free courses or training credits. Snooks advises users to buy training in blocks, instead of a la carte, and to consider bringing the instructors to their sites so they can train more people.

### Take courses online.

You're probably familiar with the cost-benefits of online training over classroom training (no travel costs, no hotel/training rooms or catering) but computer-based instruction is not suited to highly technical training that requires a lot of interaction between instructor and student, right? Not necessarily, as Osram demonstrates.

The lighting manufacturer has taken offline the third week of a four-week classroom-based Six Sigma process-improvement training course and put it online. That is, the students — Osram process engineers — take the course's third week on their computers at their desks using a Web conferencing facility from Centra. The facility lets them interact with their instructor and colleagues online.

Steve St. Cyr, quality program manager at Osram's general lighting division, chose to place that particular part of the curriculum online because it involves working with software that is easily delivered over online training. Putting the first week online was not a good idea because that time is crucial for the students and instructor to bond, he says.

Osram says per semester it trains between 20 and 30 process engineers from its 20 manufacturing facilities across North America and Mexico on the Six Sigma methodology. The company says it has saved between \$32,000 and \$34,000 in travel-related costs.

### Sometimes more is better than less.

Consider cross-training your team. In January, Osram made available 100 e-learning courses, including Microsoft Biz Talk Server 2000, Visual Basic, Java programming, HTML, XML and a range of Cisco networking courses, to its 100-plus IT staffing roster. The courses are not meant to replace instructor-led training but to encourage people to train for different skills. For example, a programmer could try his hand at installing Cisco routers or building multi-layer switched networks by taking a course. It might take a chunk of change to buy the courses and put them online, but the payback of having a team of employees who are multi-disciplined should make managers happy. ■



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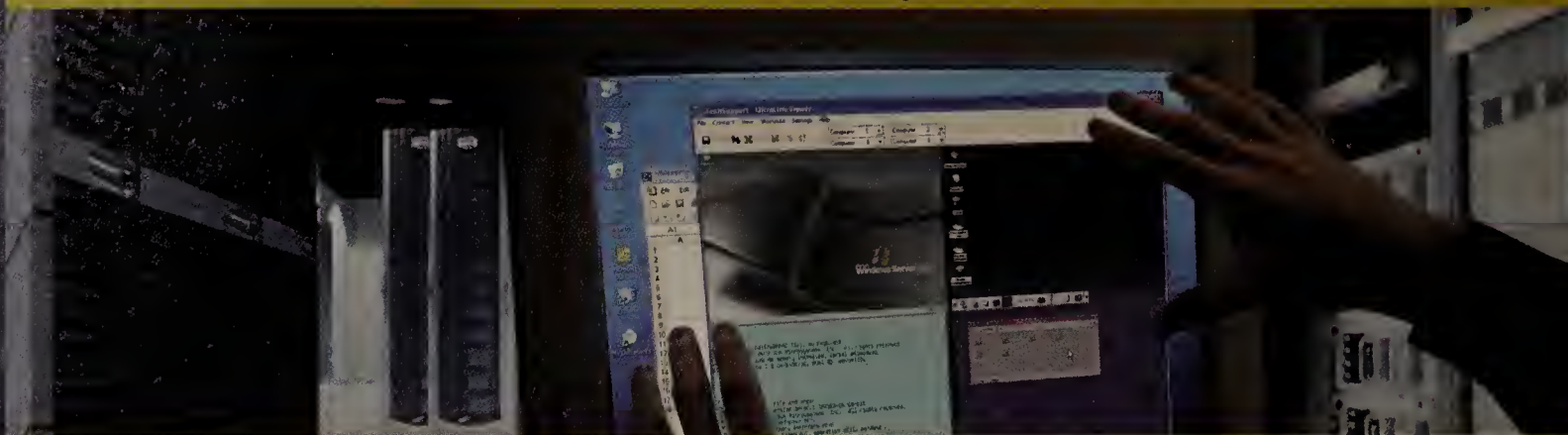
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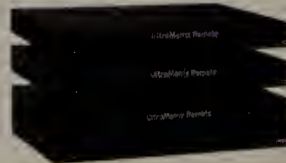
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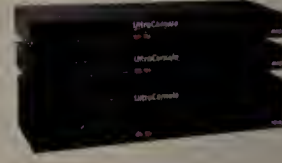


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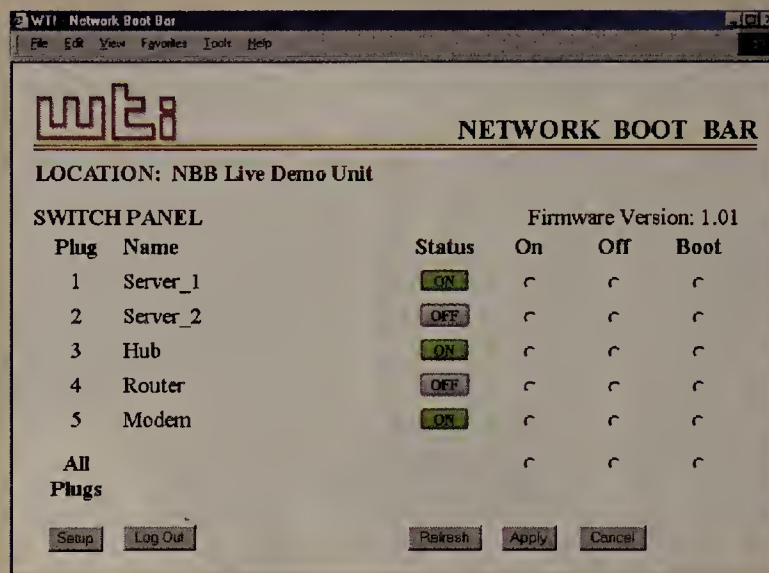
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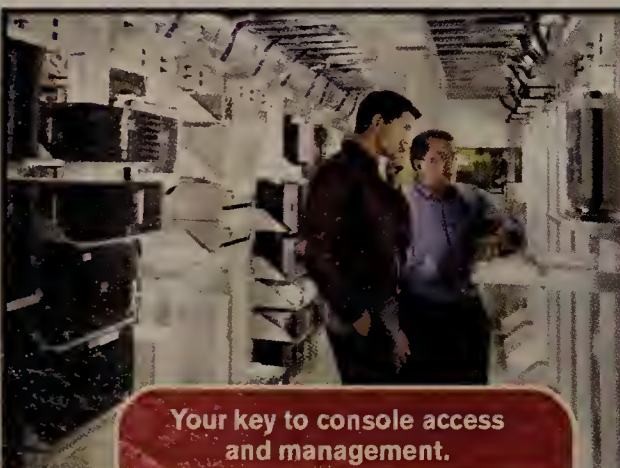


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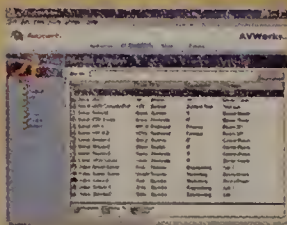
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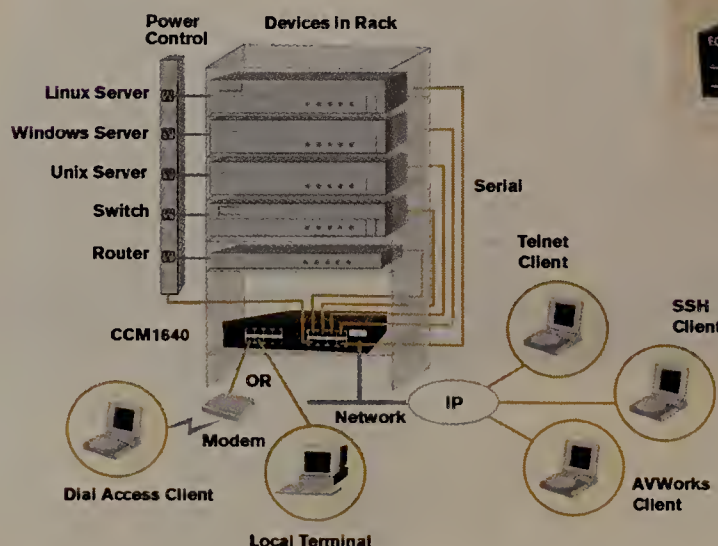
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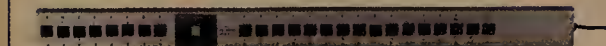
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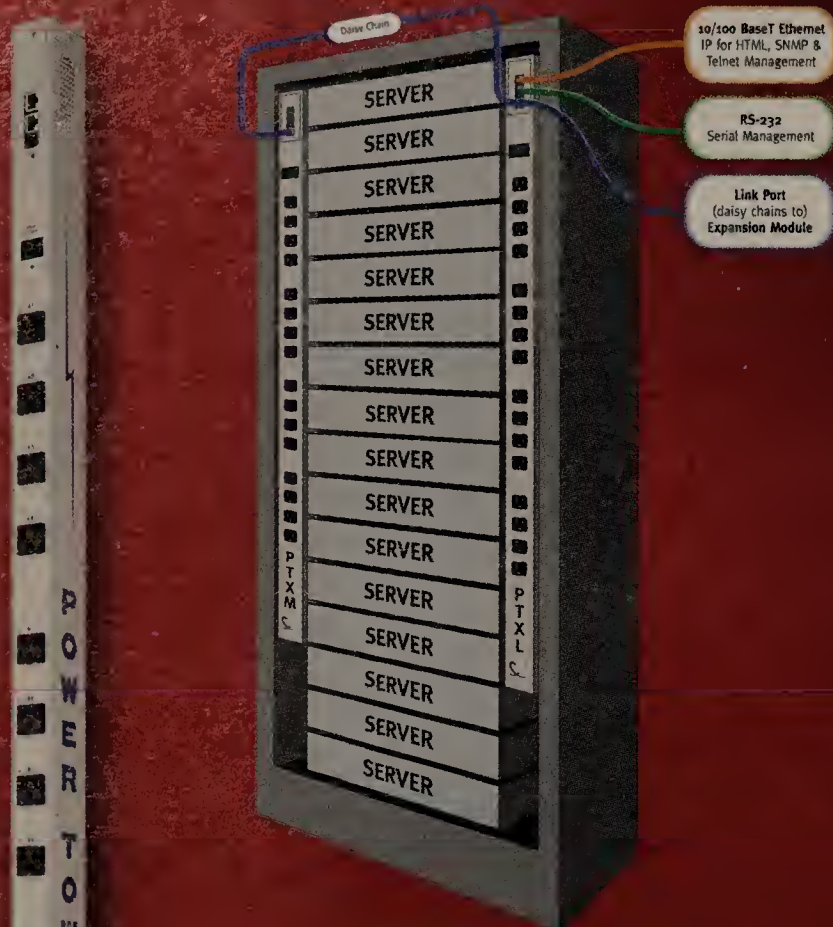


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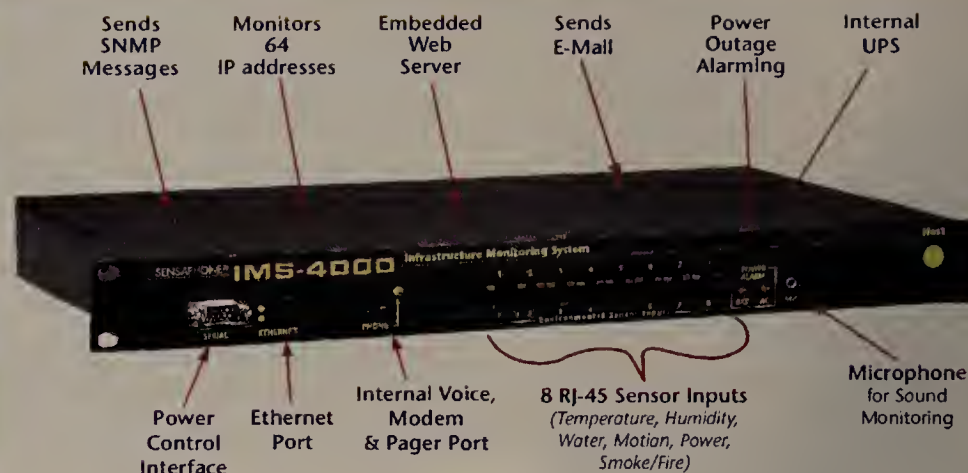
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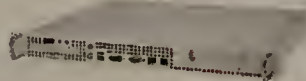
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**Applications Programmer** for NE OH to analyze user req., procedures & problems to automate processing/improve existing computer system; troubleshoot; eval. existing IS for effectiveness. Bachelor's Degree in Information Systems. Resumes to: HR, Custom System Company, 6670 W. Snowville Rd. Cleveland, OH 44141. EOE. No calls.

Seeking qualified applicants for the following positions in Orlando, FL: Senior Programmer Analyst. Formulate/define functional requirements and documentation based on accepted user criteria. Requirements: Bachelor's degree or equivalent in computer science, MIS, mathematics, engineering or related field plus 5 years of experience in systems/applications development. Experience with C and/or C++, Java and RDBMS also required. \*Master's degree in appropriate field will offset 2 years of general experience. Submit resumes to: Sibi George, FedEx Corporate Services, 1900 Summit Tower Blvd., Suite 1400, Orlando, FL 32810. EOE M/F/D/V.

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**CGI Inform. Sys & Management Consultants, Inc.** is looking for Sr. IT Consultant to develop web portal applications using Oracle 9IAS, data warehouse using pl/sql, reports6i & discoverer. Min. MS plus exp. of Oracle X/6/9, 9IAS, PL/SQL, Java-Script. Contact [lisa.halter@cgi.com](mailto:lisa.halter@cgi.com). No calls. EOE

Innovative Consulting is looking for program or system analysts, IT engineers. Candidate must have BS/MS degree. Travel is required for some positions. Skills in C/C++, VB, Oracle, SQL, SAP, WebSphere, Java are plus. Good salary. Please send resumes to [info@icscorp.usa.com](mailto:info@icscorp.usa.com). EOE

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Windows System Consultant wanted by reseller of accounting/fin. bus. appl. S/W. Requires B.S. or equiv. in Comp. Sci. plus 2 years exp. including Windows NT. Reply to H.R., Fantasia Technology Partners, LLC, 25 Lincoln St., Framingham, MA 01702.

Systems Architect for IT systems and customized applications provider in Roswell, GA. Minimum four years experience designing systems architecture and databases using JCL, ASP and SQL, including conducting business and systems integration analysis, designing applications in client/server, n-tier, intranet, extranet and web environments, integrating mainframe, legacy and windows systems and providing testing and training support. Send resume to Netwise, Inc., Attn: Human Resources, 130 Winterberry Court, Roswell, GA 30076.

Jr. Software Programmer. Assist in writing & testing comp. programs using C, C++, Javascript, Visual Basic (incl. VBScript & VBA), transact-SQL, SQL server 2000 DBA, Perl, ASP, HTML, JavaScript, XML & Crystal Reports in NT/Windows 2000 in a multi-tiered envir. Req: BS in Info. Tech. or Comp. Sci. 40hrs/wk. Job/Interview Site: Woodland Hills, CA. Send resume to Finita USA, Inc. @22123 Martinez Street, Woodland Hills, CA 91364.

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Synergy has multiple openings for IT professionals. Qualified applicants must have BS with substantial experience. Strong background in SAP, SQL, ERP, VB, TCP/IP Suite, Oracle is plus. Send resumes to hr@synergy.com. Travel is required for some positions. Sponsor GC. EQE.

CMS (Customer Management Systems) has openings for experienced IT professionals to provide full life cycle IT & business solutions to clients. Qualifications include BS with experience using SQL, EJB, JSP, UML, OQP/QQD, Lotus, Java, VB, etc. Apply at: cms@earthdome.com. EQE. No Calls.

Delasoft, Inc., IL based IT company seeking Computer Professionals (multiple openings), w/relevant edu. & exp. to analyze, devl., design, test, sprt, maintain IT Projects, w/following skills: Java technologies, Web Tech (Web Sphere, Web Logic, XML, HTML, DHTML, UML); Unix, Linux, Solaris, Sybase, Oracle databases; Testing/QA tools: WinRunner, LoadRunner. TestDirector, Silk GUI & Rational Rose Tools, SQL server. C, C++, CICS, CQBQL, SQL/PLSQL Languages; ABAP, SAP, BAAN, Siebel, TCP/IP, ERWIN & Win. envmnts. Offering top \$\$\$bnfts. 40% traveling to client sites in US. Resumes: 2200 S. Main Street, Suite 111, Lombard, IL 60148.

Computer Professionals (programmer, system analyst, software or project engineers) wanted E-Con. Candidates must have minimum BS or equivalent degree with IT experience. Use Weblogic 6.0 Application server, Java Servlets, XML. Please send resumes to: hrd@goecon.net. EOE. No calls.

Global Consulting is looking for programmer/system analysts, software engineers. Candidate must have BS with IT experience. Good skills in C/C++, Java, Oracle, EJB, J2BB, WebLogic, VB, HTML are plus. Traveling is required for some positions. Apply job@g-c-g.net EOE. No calls.

Data Consulting Group is looking for software engineers/programmers to develop security information service system using VB, Oracle based on client/server. Minimu BS with experience using Oracle, VB, Crystal Reports. Please send resumes to: recruiter@dcgroupinc.com. EOE. No calls.

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E Computer Technologies, Inc., is a computer and technology solutions provider of business-to-business and E-commerce application implementation and integration services specializing in E-purchasing systems. Our company currently has openings for the following:

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Send Resume to: E Computer Technologies, Inc., 777 S. Central Expressway, Ste #4-F, Richardson, TX or via e-mail at: jobs@ecomputertech.com.

Computer Professionals, exp'd (multiple openings) sought w/relevant Bachelors or Masters depending on position & exp in QA, VB Script, Perl, Erwin, C, C++, VC++, I Planet, ASP, HTML, DHTML, Java Script, Sybase, Oracle, SQL Server, SQL, T-SQL, MS Access, Business Objects, Crystal Reports, DB2, Windows NT, CEML, Linux, IIS, Unix, PL/SQL, Cognos, Brio, ODBC Connectivity, Netscape Enterprise Server, Application Server of Cold Fusion, Data Modelling, Informatica, ETL application, e-business intelligence, Data-warehousing, SAS, ERP, CRM, RDBMS - Oracle; GUI Tools, ASP, J2EE, JSP, JDBC Java Script, EJB, Web Sphere, WebLogic, ASR/TTS, CTI. 40% travel to client sites req'd. Resumes to: JCG Technologies, Inc., 477 Congress St, 5th Fl, Portland, ME 04101.

Systems Analyst - Analyze user reqmts, procedures & problems to automate processing & to improve existing computer system. Confer w/personnel involved to analyze current operational procedures, ID problems & learn specific input & output reqmts such as forms of data input, how data is to be summarized & formats for reports. Upgrade system & correct errors to maintain system after implmnt. Prep time & cost estimates for completing projects. BS in Electronics or Comp Engg & 2 yrs exp reqd. 40hr/wk, 9a-5p, \$17.63/hr. Send resumes to Rene Gaviola, QLRA Educational Foundation, 10101 Harwin Dr, #125, Houston, TX 77036.

R Systems, Inc. is a global information technology services company and it has multiple Job openings for the following positions at its corporate office in Sacramento as well as Project sites throughout the United States:

- Applications Programmer
- Database Analyst
- Software Engineers
- Systems Analyst
- Network Analyst
- IT Project Managers
- Business Analyst
- Sales Engineer
- Programmer Analyst
- Sales Manager
- Database Administrators
- Market Research Analyst

Minimum requirement: Bachelor's degree or equivalent and one year experience in the job offered. All positions may involve relocation to project sites.

Submit detailed resume and position applied for to:

Attn: Venkatesh Sundararajan  
5000 Windplay Drive Suite 5  
El Dorado Hills, CA 95762

## Computers

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R.R. Donnelley & Sons Co. (Nashville, TN), is seeking to hire a Process Engineer II to design, develop & document integration software used to automate & facilitate direct interaction between existing legacy systems & the general ledger. Assess the current systems/processes, recommend & implement design solutions to bridge & transform data to enable automation to the ledger. Develop & execute extensive testing plans & develop plans to migrate production ready applications to corporate production servers using version control software. Maintain, tune, execute network admin. on the development server. Must have Bach. degree in CIS & 3 yrs exp. Must have completed projects involving Visual Studio.net, Microsoft SQL Server, JAVA Script, Visual Basic Scripts, Access, ASP.net, XML, HTML, and ETL modeling, network administration & version control software. Please email resume to: corporateprocessengineer@rrd.com EQE

Software Engineers to analyze, design, develop financial apps using QQD,C++, VC++, MFC, Visual Source Safe, SQL Server, Rational Rose, CrystalReports, ADQ under Windows/UNIX OS; perform system/functional req analysis;document detailed project specs and review conceptual model with users;provide training/user support for related appl software; performdebugging/modifications of existing software. Require: M.S. or foreignequiv. in CS/Engg.(any branch) with 1 yr exp in IT. High Salary. Comp.salary. f/t position. travel involved. Resume to: HR, Autosig Systems, Inc., 201,Price Hills Trail, Sugar Hill, GA 30518.

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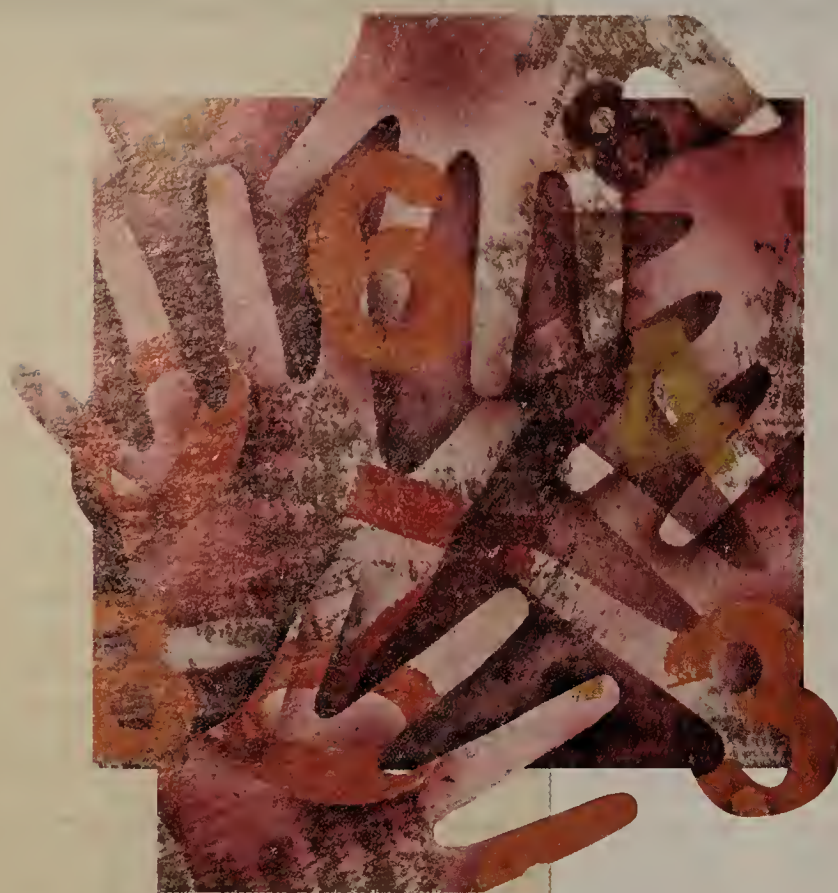
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## Voice

continued from page 1

workers produce more with new applications that convergence enables. The technology can save money by consolidating access lines, cutting long-distance costs and reducing the expense of reconfiguring PBXs when someone moves their office, but not always, he said.

Peterson likened the potential voice/data productivity gains to those reaped in the 1990s as busi-



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nesses adopted PCs, client-server technology, e-mail and the Web. They all contributed to business success, but it's hard to say just how much each contributed in terms of dollars.

So far, it seems these productivity benefits are best reached by targeted groups of employees who have specific business requirements converged messaging applications can meet. Prudential Northwest Properties, a Portland, Ore., real estate agency with about 750 agents, is two years into deploying 3Com-based VoIP and unified messaging.

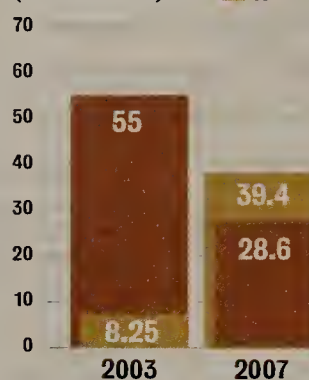
"For us, the end goal was mobility," says CIO Sean McRae, who attended the show. He says his firm saw some savings by replacing Centrex services and branch-office key systems with a centralized IP PBX, but that wasn't the main value.

The biggest payoff for the firm has been applications that let for agents be more accessible and have better access to messaging and other data resources. "Our [agents] are frequently working from home, in a car or in a Starbucks," where they access the

## Moving to IP

**While the total number of business phone lines will grow only 40 million between 2003 and 2007, IP will grow significantly as a percentage of new lines sold over the same period.**

Business phone line shipments (in millions)



SOURCE: GARTNER

unified messaging system over a VPN with Wi-Fi enabled laptops, McRae says. He says IP gets at least some of the credit for increasing sales, with some workers boosting their take up to 40%.

However, organizations with

larger, more diverse workforces say the productivity and business payoffs of IP-based convergence applications are not as apparent.

"There doesn't seem to be any [convergence] applications that could add a real business value," says Edward Jackson, technical specialist with Cardinal Health, a Chicago maker of medical products with more than 30,000 employees nationwide.

"We have such a diverse group of users on such different platforms, it's hard to find one single application that will instantly make everyone more productive," he says. "If we were to buy \$1 million worth of [IP telephony] products, it had better produce \$20 million in revenue. I don't think any [IP telephony vendors] have products that will do that."

Jackson came to VoiceCon to check out products for a potential migration of sites to IP telephony from TDM PBXs — a mix of Avaya, Nortel and Siemens gear at 90 sites. But he says installing IP PBXs to reduce long-distance or internal administrative costs would not produce savings because most calls — 80% — that originate inside the company are to people outside. "The company doesn't call itself very much," he says.

The strongest immediate driver for switching to IP telephony will be the need to upgrade old PBXs as their usefulness expires, says Brian Riggs, an analyst with Current Analysis. Replacing them with IP technology is the logical way to go. "The soft savings [a customer] might see from a unified messaging system or employees with softphones is

hard to quantify," he says.

"There isn't a compelling reason right now to throw out a PBX and install an IP PBX, unless it's a brand-new facility," Riggs says.

Businesses also are having trouble justifying a change from TDM service providers to IP service providers for voice. Traditional voice services are so inexpensive that potential savings are minimal, says Steven Taylor, principal at consulting firm Distributed Networking Associates.

One user at the show, Niraj Patel, the executive vice president and CIO of GMAC Commercial Mortgage of Phoenix, says an IP converged WAN is boosting productivity, but he acknowledged he had no way to prove it. The network supports videoconferencing that he says has led to closing multi-million-dollar deals. Laptops support softphones that give workers the same voice and data access they have at their desks at work.

There are savings, but they are not compelling enough on their own to warrant the transition, he says. TDM circuits with an IP service from Masergy Communications for both voice and data saves \$60,000 per year in international voice calls and \$100,000 in videoconferencing calls.

The decision comes down to business needs, says John Kealey, manager of applications for Canada's IT Services Division, which researches IT options for government agencies. "If you need to offer new services that only IP supports, then you buy it," he says. ■



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## SIP catches on

Vendors at VoiceCon 2004 introduced support for Session Initiation Protocol that they say will lead to more efficient routing of IP traffic and enable presence-based applications.

3Com says a new SIP call routing feature, called Boundry Voice Routing, in its VCX enterprise softswitch will let branch-office IP PBXs query a central SIP database to determine the best way to route traffic. This feature will be a software update to the VCX. The company also gave a sneak peek at an IP PBX called the VCX 5500, a rack-mountable branch-office system that can connect with the public phone network in case a central VCX 7200 fails. The software update to the VCX is available and free to existing customers.

At the show, Microsoft said the next version of the company's Live Communication Server, code-named Vienna, will let SIP-based Windows Messenger clients make calls through IP-enabled PBXs that use H.323 rather than SIP for signaling. By encapsulating H.323 messages in SIP, Microsoft said it could let almost any XP-based PC act as a softphone client to a PBX, while also supporting multimedia and instant messaging applications on Live Communication Server. The new capabilities will work with Nortel's Meridian and Avaya's legacy Definity PBXs with VoIP cards, said David Soklic, lead program manager for Microsoft's Live Communication Server. Pricing and availability were not disclosed.

"If enterprises are looking for a Lingua Franca for all devices and applications, we think SIP is the way to do that," Soklic said during a session on SIP in the enterprise.

Separately, Citel released an updated version of its Citel Link SIP Handset Gateway. The appliance lets digital PBX handsets be used in SIP-based IP Centrex hosted telephony systems or with SIP-based IP PBXs.

The new version supports handsets for Nortel Meridian 1, NEC DTERM PBX and Avaya/Lucent Definity systems. The previous version supported only Nortel Norstart handsets. The Citel gateway has been certified to work with IP PBXs from 3Com and Mitel Networks. It costs \$130 per port.

Also at the show, Lucent introduced a package of IP telephony gear for large businesses that has been scaled down from its carrier grade offerings.

Although Lucent's Accelerate Enterprise Solutions package is based on H.323 today, the company says it plans to support SIP.

The new package includes Lucent's Enhanced Business Services Server, a portal that unites computer and telephony features to support services such as click to dial, call logging, PC access to voice mail and presence. Also included is gear from Lucent partner Broadsoft.

Pricing is per desktop and ranges from \$200 for very large installations to four times that for small installations.

— Phil Hochmuth and Tim Greene

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## Microsoft

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tangle of software maintenance offerings to a single plan.

When Matthews signed the contract, a new version of SQL Server code-named Yukon was slated for release in 2003, but the ship date slipped into early 2004 and then to the end of this year, which is beyond the expiration date of his contract.

"We were specifically planning to upgrade to Yukon, which we had been expecting for ages," Matthews says. "It leaves a bad taste in your mouth. As the CTO, it

puts me in a bad position to go into the CFO and tell him we got nothing for this and this and this."

With his contract expiring in June, Matthews says he also got nothing for the tens of thousands of dollars he spent on Windows XP, but added he saw value in Software Assurance contracts on Windows and Office with the shipment of Windows Server 2003 and Office 2003.

Microsoft and every other major vendor do not guarantee software upgrades as part of their maintenance contracts. But users view upgrades as the meat of their contracts.

Matthews says Software Assurance was marketed from the start as the way to guarantee rights to new software. Howls of customer protest greeted the 2001 introduction of Software Assurance and Microsoft's new Licensing 6.0 program. In addition to fears of higher licensing costs, critics said one of Software Assurance's pitfalls could be Microsoft failing to deliver new software during a contract.

"We didn't buy [Software Assurance] just for that reason," says Jason Givens, senior systems analyst for Southwestern Energy in Houston. "We don't upgrade on a fast cycle, and by the time our [Software Assurance] expired we would have been in the same boat [as Digitech]." He says phone, Web and other support services subsequently added to Software Assurance are of no value to him.

Microsoft, however, says those offerings are significant to Software Assurance, which has been revamped over the past two years to offset customer complaints about its value and cost.

Microsoft's software maintenance costs are the highest in the industry, at 29% of the full retail price for desktop software and 25% for server software. A \$368 Office license would carry nearly a \$107 fee for Software Assurance.

The industry average is 21%, according to Forrester Research.

"We learned a lot since launch, and we are trying to take that feedback and act on it," says Sunny Charlebois, product manager in Microsoft's worldwide licensing and product group. She disputes that Digitech received nothing for its \$30,000, saying Microsoft shipped Notification and Reporting services for SQL Server as well as SQL Server CE, which were available to Software Assurance customers. But Digitech does not use that technology.

In September, Microsoft added training, support and software tools, and home-use rights for Office to the Software Assurance menu, but did not cut the price, noting that Software Assurance was now more "than just upgrade protection."

"The majority of the reason they added all this stuff is they anticipated upcoming renewals, and customers questioning the value of [Software Assurance] and why they didn't get upgrades in their previous contracts," says Julie Giera, vice president of IT management and services at Forrester.

## Going, going, gone

**Microsoft will see more than 200,000 user contracts expire for its Upgrade Advantage software maintenance by July. Over the past two years, those contracts have contributed significantly to the company's top and bottom lines, and now Microsoft faces the task of re-signing those users to new Software Assurance contracts.**



## MIMO

continued from page 12

cover an entire office or home, for example. The Airgo chipset will support both the 802.11b/g 2.4-GHz band and the 802.11a 5-GHz band, the vice president says. The chipset will deliver full MIMO benefits with MIMO clients. With existing 802.11b/g and 802.11a clients, the chipset will work like a conventional WLAN radio, but with somewhat longer range.

MIMO is just one form of smart antenna. Motia has designed its Javelin 2.4-GHz chipset, coupled with a four-antenna adaptive array, as an add-on for existing 802.11 radio transceivers. The chipset combines signals to shape an optimal radio beam, and like MIMO uses the multipath method, says Robert Warner, vice president of sales and marketing. Motia plans to have chip samples available shortly, with volume production by June.

Wireless switch vendor Vivato Networks uses another smart antenna technique, called phased array. This approach packs a lot of individual antennas, each with a slightly different directional pattern, into a single panel. Algorithms steer the radio beam to the appropriate antenna elements for a given WLAN client. The result is a big increase in range, though this technique has been most successful in outdoor applications.

MIMO is unique because it multiplies bandwidth by essentially providing multiple channels between devices, says Ben Manny, director of the radio communications laboratory in Intel's corporate technology group. "MIMO is the one antenna [approach] that gives you higher point-to-point data rates," he says.

Intel is running a range of MIMO projects, with an eye toward moving more wireless radio functions into complementary metal-oxide semiconductor (CMOS) silicon.

Two other WLAN chip makers, Atheros Communications and Broadcom, are researching MIMO, but both declined to specify the resources they're devoting to it or when they will have chips available. Executives at both companies say MIMO is relatively expensive to create in silicon and that buyers will resist paying even a small premium for more WLAN throughput or range. They add that buyers will resist products that fall outside the IEEE standard.

Atheros uses a technique called channel-bonding to double data rates for its 802.11g and 802.11a/g chipsets. This technique combines 54M bit/sec channels to create one 108M bit/sec channel.

Airgo's Raleigh says channel bonding comes with its own high price: It uses up scarce radio spectrum. A better approach, he says, is to increase the data through a given channel, which MIMO does. ■



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"Microsoft has boatloads of renewals coming up."

Microsoft CFO John Connors told financial analysts in January that more than 200,000 Upgrade Advantage software maintenance contracts will expire by July. Upgrade Advantage is one of the programs Software Assurance replaced two years ago. At the time, many users rushed to sign new Upgrade Advantage deals to avoid Software Assurance, with those contracts providing Microsoft with \$1.8 billion in fiscal 2003 and \$1.1 billion in fiscal 2004 (which ends June 30).

"Basically we've got a \$1.1 billion hole we have to fill going into [fiscal year] '05 from Upgrade Advantage," Connors told the financial analysts. "We definitely do have a tougher hurdle going into [fiscal year] '05 than we had going into [fiscal year] '04, and we've got to figure out how do we make progress against that hill when we know it sits there."

One problem is that Upgrade Advantage customers under Microsoft's Open and Select licensing contracts tend to be smaller companies that buy software on a license-only basis, which means they buy licenses when they need them. Software Assurance is an annuity program, in which users pay a recurring fee for upgrade rights. Microsoft will have to try to change the mindset of those users. Typically 75% of users re-sign for Microsoft's other licensing program, Enterprise Agreement, which is for larger companies and includes Software Assurance.

Connors said Microsoft would be disappointed if it moved only 10% of those Upgrade Advantage customers onto Software Assurance and surprised if it topped 30%. "If we didn't get 10% ... it's probably an indication that the market isn't valuing our Software

Assurance offering," he said.

To combat that notion, Microsoft recently said it was working on something called XP Reloaded, which appears to be an interim release of the desktop operating system before the big upgrade to Longhorn now slated for 2006. It also lets Microsoft put some software in the pipeline for Software Assurance customers. A similar upgrade is rumored for Office, which won't be revised again until the Longhorn time frame. Those two products are Microsoft's historic cash cows.

"This is a thorny issue for Microsoft," says Laura DiDio, an analyst with The Yankee Group.

Case in point: Exchange users became upset when Microsoft recently released its Intelligent Message Filter but made it available only to Software Assurance customers.

DiDio says the software maintenance issue is not good for Microsoft in these days of tight IT spending and pressure from open source software. "[T]he chief reason to buy into the [Software Assurance] program is to get upgrades, the rest is icing," she says.

DiDio and Forrester's Giera say now is the time to sharpen negotiating skills.

"We don't say wholesale that customers should renew their contracts, that would be crazy," says Giera, who has developed an ROI calculator on Software Assurance for her clients. "Look at the [Software Assurance] features — how often do you call support, how much do you spend on training. Prepare a top 10 list of your needs."

She says Microsoft is giving concessions. "Customers can use this situation to their advantage," she says. ■



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## BackSpin Mark Gibbs



# Nightmare or regulation, your choice

**W**hen does a product or service become so important to our culture that it becomes what you could call "cultural infrastructure"? By that I mean something that, if you removed it from our lives, would have serious financial and/or social consequences

that would compromise the well-being of a significant number of people.

What is on my mind is the role of Windows in our culture. A couple of weeks ago at the RSA Conference, Microsoft revealed it is taking a new approach to computer security called "behavior blocking."

This actually isn't a new idea — Cisco and Network Associates use this concept today — but in Bill Gates' conference keynote address (something Gates usually turns into a marketing pitch) he said, "you can really think of this as taking the notion of secure by default to the next level."

Unfortunately, Gates offered no details of the technologies to be used or when they might appear. But the message is clear: Microsoft wants us to think that something is being done and that the company's Trustworthy Computing initiative hasn't stalled out.

But we can't wait for protection from all the threats that face us and we can't trust in hand-waving as a guarantee that we will have security in the future.

Just consider what would happen if a virus appeared tomorrow that capitalized on some obscure, hidden code in the Windows kernel that let it infect any machine it could connect to. Let's say that it could do so silently.

Now let's further suppose that at a set time the virus trashes every infected machine's registry or maybe deletes the host PC's file allocation table.

"Couldn't happen!" you say? How do you know it hasn't already happened and that the trigger data just hasn't been reached yet? What if that date is tomorrow? Or in 10 minutes?

Whatever this threat exactly is or whenever it might do it, we would have a catastrophe in the making. The scale of the problems this could cause would be staggering — booking systems down, point-of-sale systems dead, back-end systems offline — it would be a disaster of biblical proportions.

In the 1800s when the railroads were being developed, it wasn't obvious at first that they would become cultural infrastructure. The same applied to the telephone system and the gas and oil industries, the power supply industry and on and on.

But at some point we noticed that it was necessary for us to elevate these products and services to the status of cultural infrastructure and regulate them. We didn't take the businesses away from the owners of the railroads and the telephone systems as was

done in Europe, but rather we created a regulatory structure that was supposed to ensure the integrity of the services for the benefit of the people.

Of course, politics and vested interests have made what was originally a philosophically and ethically sound idea look more like a fight for bargains at a post-Thanksgiving red-tag sale, but that is, unfortunately, the nature of politics.

Be that as it may, without such regulation, our society would be very different and less cohesive than it is today. This is because there is a very real limit to how much we can trust our fellow man to do the right thing.

Therein lies the problem with Windows. It has gone beyond being just a product and has evolved through its success into cultural infrastructure. And now it needs regulation.

While I, like you, dislike government interference in general, just think of what things would be like without regulation. Think telephone service is bad now? Deregulated telephone service probably would be a nightmare. A nightmare rather like the situation we could be in unless Microsoft gets security right or we take charge and make the software company get it right.

*Howls of protest or wild cheering to backspin@gibbs.com.*



## 'NetBuzz News, insights, opinions and oddities

By Paul McNamara

### Instant message

Most any conversation about instant messaging inevitably turns to the lack

of product interoperability that continues to exert a drag on enterprise adoption and bedevil those who see no choice but to dive in anyway. Such was the case at last week's Instant Messaging Planet conference in Boston, where vendor speakers tripped over one another — and their tongues — in an attempt to assure attendees that IM's time is now even though interoperability still can't find the party.

The message wasn't always well received, despite the fact that these vendors were preaching to a choir of IM enthusiasts.

"We're all working very, very hard to solve this problem," Jon Sakoda, vice president of products at IMlogic, said at the end of one conference session.

Rather than applaud, the audience erupted in laughter. Not the reaction one would expect, although Sakoda might have earlier laid the groundwork for his being dissed when he rattled off the familiar litany of problems plaguing corporate IM adoption and labeled them all "myths."

Another panelist, Kieran McCorry, a principal consultant at HP, helped crystallize the scope of the IM challenge when he told of an internal survey that showed tens of thousands of HP employees using each of four different IM packages: MSN, AOL, Yahoo and Jabber. Any attempt to standardize on a single enterprise IM product for the company's 160,000 employees would be met with fierce opposition from all these factions, whose members argue convincingly that the consumer-oriented clients — however flawed and limited — have become indispensable business tools.

"I'm sure if we turned them off it would create a lot of headaches for a lot of people," McCorry said.

A number of conference attendees painted similar scenarios in their ques-

tions posed to panelists, whose answers were variations on the theme that there's plenty of value to be gleaned from IM today and plenty of third-party vendors willing to take your money to show you how. Those who might be tempted to wait for all the interoperability and standards issues to sort themselves out couldn't have taken much comfort from the general tone of resignation about that wait being of indeterminate length.

Perhaps indicative of how much work remains was the enthusiastic response from attendees to Reuters Messaging, a fee-based service that will let Reuters customers securely interact via yet another proprietary IM client with users of AOL and MSN, a trick that has heretofore been rendered impossible by Microsoft's unwillingness to play nicely. But the Reuters service, which isn't expected to launch until this summer, will be available only to the financial services industry and initially won't include access to users of Yahoo or enterprise IM systems such as Lotus Sametime.

In other words, it's not going to be the interoperability answer for most who went to this conference hoping to find one.

So when might the industry — particularly the keepers of the major public IM networks — put aside their differences and help make IM as easy as e-mail?

"It's a matter of will. It's not complicated," said Microsoft's Paul Haverstock during his keynote speech. An architect for his company's RealTime Messaging and Platform Group, Haverstock added that under the current state of stalemate, "the only ones who are suffering are the businesses" that use IM.

It's difficult to imagine how that answer was helpful to anyone.

Another panelist at least scored points for candor:

"If I was to leave you with one bit of advice it would be: Plan on a heterogeneous IM environment," said Ennio Carboni, IMlogic's director of product marketing.

This time no one laughed. . . . I can't be certain there weren't any tears.

*Confession: This columnist doesn't do instant messaging. The e-mail address is buzz@nww.com.*





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